FEBRUARY 5, 1996 VOLUME 13, NUMBER 6

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

BUSY, BUSY, BUSY

Novell sells off WordPerfect, hands off some Tuxedo development work and links GroupWise to the Web. Page 10.

So what's in it for me?

At a whopping 280 pages, the Telecommunications Act of 1995 raises an awful lot of issues. Here are answers to questions about how this bill will affect you, the network IS professional.

What immediate changes can I expect in terms of choice of carriers and services?

Very little. With three exceptions, users will continue

See Q&A, *page 14*

Let the competition begin!

Landmark reform bill ushers in telecommunications free-for-all.

By David Rohde

Washington, D.C.

A new era of telecommunications has begun, but the benefits to you are still lurking somewhere on the horizon.

After years of lobbying and posturing, Congress last week finally rewrote the 62-year-old law that has controlled — some say hamstrung — the network industry. The reform bill knocks down long-standing barriers in local and long-distance services, cable television and other markets, and is likely to spawn more hybrid services and corporate mutations — via mergers and partnerships — than any biotechnology lab.

But corporate network managers will have to show some patience before reaping any big gains in pricing and packaging of carrier services, because the Telecommunications Act of 1995 won't bring overnight change (see accompanying story). Rather than immediately ending restrictions on carriers, the bill instructs an already overworked and underfunded Federal Communications Commission to write new rules in dozens of areas.

Heralded as opening a free-for-all in the network field, the bill is actually a monumental compromise among competing interests, such as long-haul carriers and regional Bell operating companies.

See Competition, *page 14*

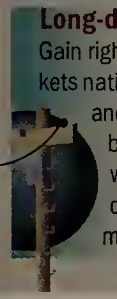
Read up on telecommunications reform on Network World Fusion. On-line resources include:

- An update on the latest reform news
- Carrier white papers on expected changes
- Copies of congressional bills and reports

Select News+ then Front Page.

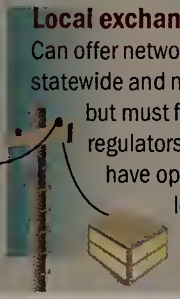
NetworkWorld Fusion http://www.nwfusion.com

WHAT THE TELECOM REFORM BILL MEANS FOR:



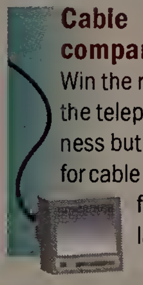
Long-distance carriers

Gain right to enter local markets nationally for switched and dedicated services but have to negotiate with RBOCs for interconnection arrangements.



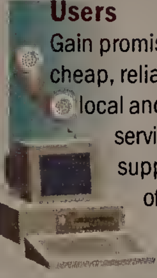
Local exchange carriers

Can offer network services statewide and nationally but must first prove to regulators that they have opened up the local loop.



Cable companies

Win the right to enter the telephone business but must wait for cable TV rates to be fully deregulated.



Users

Gain promise of obtaining cheap, reliable broadband local and long-distance service from a single supplier as a result of intense new competition.

IBM drops $743m on management makeover

By Jim Duffy and Michael Cooney

Armonk, N.Y.

Just eight months after outlining its broad SystemView distributed systems management strategy, IBM last week drastically redefined that game plan by agreeing to buy Tivoli Systems, Inc. for $743 million.

By acquiring Tivoli and its object-oriented Tivoli Management Environment (TME) software, IBM officials said they will be able to deliver distributed systems management products for the client/server market two years ahead of schedule. IBM also will gain tools for managing Internet environments and applications, which could be a

See IBM, *page 50*

How Apple blew it in networking

By Peggy Watt

Cupertino, Calif.

The computer for the rest of us still can't talk to most of us.

That simple fact goes a long way in explaining why Apple Computer, Inc. Chief Executive Officer Michael Spindler abruptly resigned last week, turning over his position to board member and National Semiconductor Corp. CEO Gilbert Amelio.

It is true that the Macintosh, which just hit its 12th birthday, is today a much better member of the corporate network than its proprietary protocols initially allowed. But that still isn't nearly enough — and the company has the sagging financials and market share to prove it.

Former CEO Michael Spindler *recognized the impact the 'Net could provide.*

Critics charge that Spindler, with his focus on the consumer market, simply took his eye off the network ball.

Apple will have to scramble to recover.

Customers complain that network products dominate a long list of delayed Apple projects and account partly for its curent bleak picture. For example, the multiprotocol utility Open Transport, the next version of the MacOS, and new servers that were intended to run Unix as well as enhance the Macintosh's connectivity in corporations have all fallen behind schedule.

Because of that, Apple and its third-party developers simply do not offer the breadth of network-

See Apple, *page 12*

NEWSPAPER $5.00

Access Network World Fusion using the number in yellow. See page 5 for details.

Cabletron preps ISDN gear

By Jodi Cohen

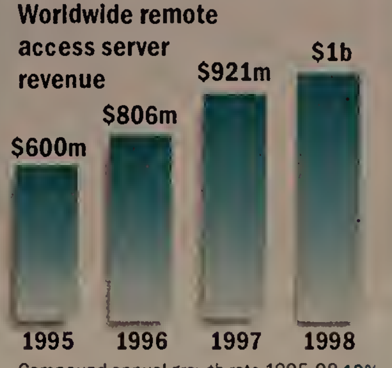
Rochester, N.H.

Cabletron Systems, Inc. is readying a line of remote access devices for its hubs that provide connectivity over ISDN lines as well as improved security and management capabilities.

The products, expected to ship in the second half of the year, take Cabletron's remote access strategy beyond the company's existing terminal server and analog dial-in offerings to

See Cabletron, *page 12*

BOOM TIME FOR REMOTE ACCESS



Compound annual growth rate 1995-98 19%

SOURCE: IDC, FRAMINGHAM, MASS.

Standards

Microsoft wins over workflow consortium

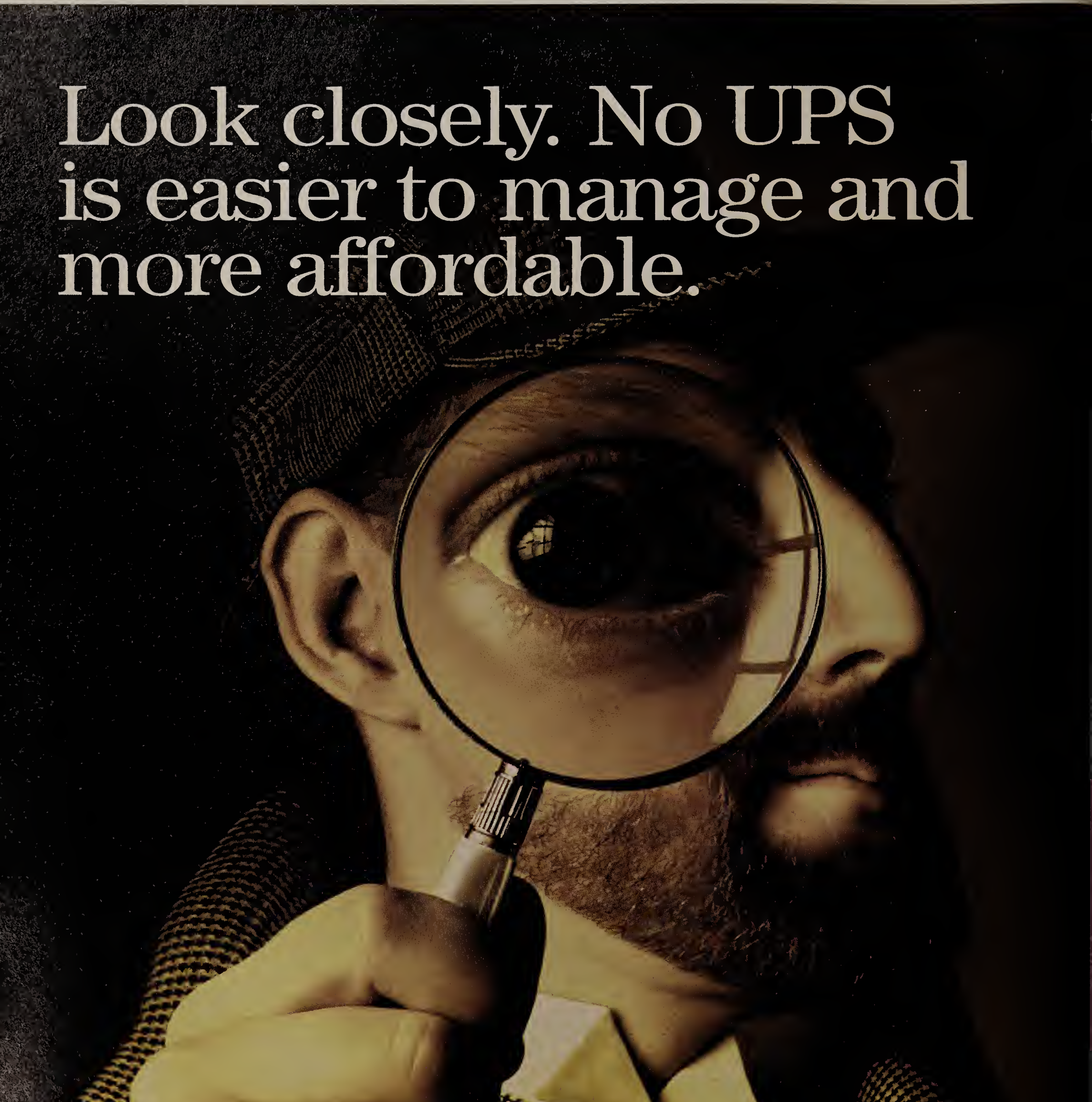
By Barb Cole

Redmond, Wash.

A consortium of more than 40 vendors has agreed to use a new Microsoft Corp. specification as a foundation for a key workflow interoperability standard.

The Workflow Management Coalition's specification is likely to make it easier for users to deploy large-scale workflow applications because it provides a common set of commands for

See Microsoft, *page 50*



* List prices as of October 1, 1995. † PowerWise Assistant; shutdown, management and diagnostics software for Windows NT and Novell Netware (other OSs available separately). © 1995 Hewlett-Packard Company. All rights reserved.

$319*

HP PowerWise L600
(Incl. Software†, SNMP agent, OpenView Utility, cable)

$489

HP PowerWise L900
(Incl. Software†, SNMP agent, OpenView Utility, cable)

$519

HP PowerWise 1000
(Incl. Software†, OpenView Utility, cable)

$649

HP PowerWise L1250
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$1179

HP PowerWise 2100
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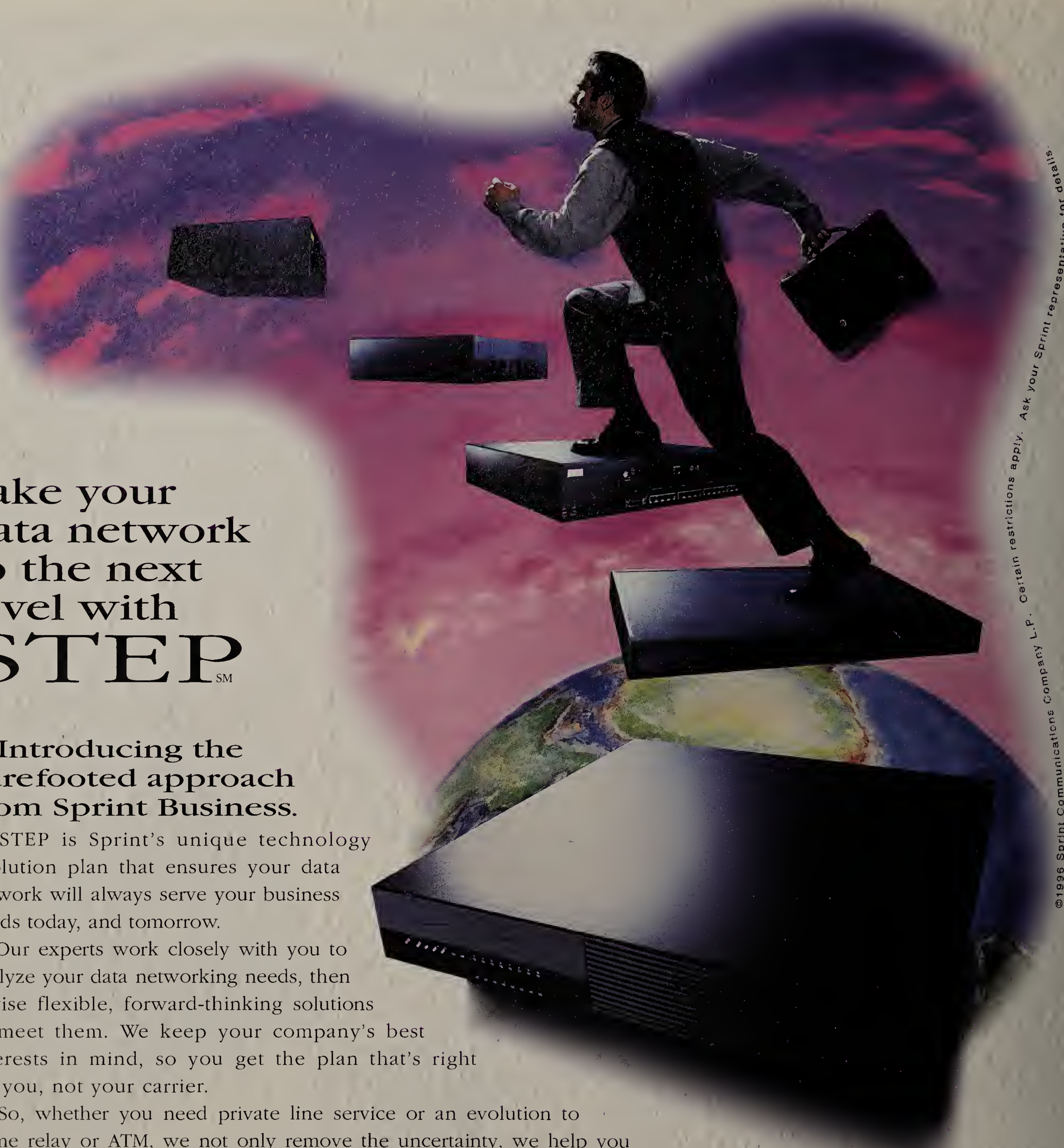

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This Week

News+

The Front Page:

- **IBM/Tivoli:** Find out what all the fuss is about by reading articles on Tivoli and its management platform.
- **Apple:** Peel away the hype with links to technical documents about the Copland operating system and CyberDog Web development tools – technologies some are calling Apple's best hope for the future.

The Technical Sections:

- **EDI:** See who the EDI translator vendors are and what they've got for sale, in Electronic Commerce.
- **Site licensing:** Keeping track of your software licenses got you down? Maybe one of the metering packages in our review can help, in Local Networks.
- **Web development:** Spin some fancy Web applications with new development tools from relational database vendors; see what they're planning next, in Client/Server Applications.

Forum

WAN Monitor: Scott Bradner is the latest *Network World* columnist to go interactive on Network World Fusion. Now you can comment directly on his "WAN Monitor" columns. Select Columnists, then Scott Bradner/WAN Monitor.

- **Professional Development:** New seminars.
- **DirectConnect:** Download demo software.
- **Network World Central:** Get in touch with us.

this week's pick

Viruses, shmiruses. If you really want to worry about what could happen to your net, jump over to the Institute for the Advanced Study of Information Warfare. Here you can read up on the latest techniques for monitoring computer activity from afar with no net connection, government plans for disrupting global data nets in time of war and more, at http://www.psycom.net/iwar.1.html.

HOW TO GET ON TO NETWORK WORLD FUSION

At the welcome screen, click on First Visit and follow the instructions. Subscribers, keep your NWF number – highlighted on the front cover's mailing label – handy during registration. Non-subscribers must fill out an on-line registration form.

Network World Fusion CONFERENCE PICK

HOT TOPIC

Firewalls: It's not just packet filtering anymore. Or is it?

Discuss the ramifications of extending client/server applications out onto the Internet in nwfusion.com, Topic 20.

NetworkWorld
An IDG Publication

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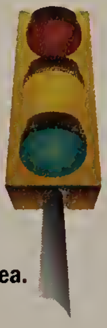

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NetworkWorld's *Mission: To provide news and analysis that help network IS professionals deliver the network computing infrastructure and distributed applications required to meet evolving business needs.*

News briefs, February 5, 1996

Netscape snares InSoft in its web

■ Netscape Communications Corp. of Mountain View, Calif., last week announced a $161 million agreement to buy InSoft, Inc., which makes the CoolView videoconferencing and CoolTalk audioconferencing products. Netscape plans to integrate the InSoft technology with its own Web browser and server software to better enable Internet-based conferencing. InSoft revealed to *Network World* last month that it was in touch with Netscape and other Internet product companies to blend its technology with theirs (*NW*, Jan. 15, page 12).

Banyan readying 'Net assault

■ Banyan Systems, Inc. next week plans to announce a set of Internet products it hopes will revitalize its business. The strategy centers around Coordinate.com, a Web service that will host a version of the StreetTalk directory called Switchboard. Under a deal with digital authentication vendor VeriSign, Inc., Banyan will enable Switchboard to host most of the personal public keys now held by VeriSign. Switchboard will let users locate the electronic mail addresses of colleagues and verify their identities. Also on the way is BeyondMail Personal Internet Edition, an E-mail product with agents that can periodically scan favorite Web sites and message users with new information. The beta is available on the Web at beyondmail.banyan.com.

Web groupware on tap

■ Process Software Corp. last week said it will extend its line of Web servers by year-end to include groupware applications. Process also announced it is shipping Version 1.2 of its Purveyor WebServer for Windows NT, which includes Verity, Inc.'s Topic search engine for search and retrieval of text and HTML files.

Playing GAMES

■ IBM, NCR Corp. and Platinum Technology, Inc. have united to form a consortium of users and vendors dedicated to improving enterprise systems management. Called the Global Alliance for Managing Enterprise Systems (GAMES), the group will sponsor an annual exposition and conference highlighting cross-platform systems management offerings, and conduct ongoing communications forums between users and vendors. The first expo, GAMES 1996, will be held June 13-16 in New Orleans. GAMES can be reached at (312) 527-6634.

Whatever happened to Bellcore?

■ Bellcore, the once-exclusive research arm of the Baby Bells and a respected standards setting and keeping body, is up for sale and looking for new business to keep it going once it is dropped by the regional Bell operating companies. The company last week announced at ComNet '96 the first two entries: enterprise network consulting and a certification program for equipment and services.

Jasmine blooms at CA and Fujitsu

■ Computer Associates International, Inc. and Fujitsu, Ltd. last week announced Jasmine, an object-oriented database and development tool set for building and running multimedia applications. Applications can be built incorporating a wide array of complex data types such as graphics and video, and deployed on workstations or as a plug-in to standard Web browsers. The software development kit is available now free of charge for third parties. Jasmine will ship in September and is priced starting at $2,000.

Intel sounds bug alarm

■ Intel Corp. last week announced that a specific configuration of LANDesk Virus Protect 3.0 may cause customers to experience unwanted file movement or loss of files. Intel is providing an update that disables the faulty configuration. A message about the bug has been posted at various on-line sites, including the Intel Web site at http://www.intel.com/comm-net/sns.

Microsoft lags on net management

By Kevin Fogarty and Ben Heskett
Redmond, Wash.

At Microsoft Corp., network management takes a backseat to desktop operating system sales.

Microsoft officials last week confirmed that the company has delayed work that would add network management features to its Systems Management Server (SMS).

Instead, it has focused on features that will make it easier for corporations to buy and install Windows 95 and Windows NT Workstation.

Microsoft also is scaling up SMS development to add Web hooks to the next two versions of the product, officials said.

The delay in Simple Network Management Protocol support could disappoint customers. Many expected that Microsoft's acquisition of the British Network Management Corp. last summer meant NMC's SNMP enterprise net management technology would appear in SMS to make managing large NT networks easier.

"With the release of the next version of NT Workstation, we think people are really going to decide which operating system to use — NT Workstation or Windows 95," said Phil Holden, product manager for SMS. "Either way, SMS can help. We've concentrated on the systems management stuff to help make migration easier. That's the reason the net management won't happen until later."

Microsoft will ship some SNMP support in SMS 1.2, which is due to go to beta in the second quarter. However, net management capabilities — such as the ability to map networks, auto discover network devices and reconfigure routers — will not come until the next major release, which will go to beta late this year, Holden said. That release will still rely on proprietary protocols to monitor NT events but will include the ability to display SMS data and SNMP data on one console, according to sources briefed by Microsoft.

As a result, NT customers hoping to deploy the operating system widely and manage it using standard tools will have to use SMS in addition to SNMP management platforms.

"Microsoft has positioned NT as an enterprise network operating system, but they still look at the world in terms of PCs, not the network," said Sylvia Clark, analyst at Aberdeen Group, Inc. in Boston. "They've never articu-

See Net mgmt., *page 12*

The road to net management

July 1995
Microsoft buys Network Managers, which makes the NMC Vision SNMP enterprise management product.

January 1996
Microsoft announces Systems Management Server 1.2, equipped with the ability to generate SNMP traps.

Q2 1996
SMS 1.2, featuring the ability to monitor Microsoft's Web server, will enter beta testing.

Late this year
Next major version of SMS will go to beta with Web and 'Net management, and 1 console with NT and SNMP data.

Microsoft and MCI join their software, network services

By Joanie Wexler
Washington, D.C.

Microsoft Corp. and MCI Communications Corp. are linking empires.

The two companies last week said they intend to merge several of Microsoft's software products with MCI's far-reaching network services, forming a cohesive on-line offering that customers can buy from either company. The integration efforts are slated to yield fruit as early as this quarter. They will, among other things, allow users to access MCI network services, such as networkMCI Conferencing, by clicking on an icon in the Windows operating system, explained Microsoft Chairman Bill Gates.

Gates *says Windows users will be able to access MCI net services.*

In addition, buyers of Microsoft products, such as Windows NT, could bundle MCI long-distance, ISDN and frame relay services in with their purchases, explained Ron McMurtrie, director of marketing for MCI business enterprises.

Many of the joint moves have an Internet flavor. Until now, MCI's Internet offerings were limited to access services only.

"This is MCI's way of adding services on top of [access] and moving up the value chain," said Steve Franco, program manager for interactive communications research at The Yankee Group, a Boston consulting firm.

MCI also has deemed Microsoft's Internet Explorer browser as its preferred browser and will package it with its Internet access services.

Microsoft's Web creation tools and Exchange Server will become part of MCI's Web hosting services.

MCI's reselling of Exchange Server — a forthcoming groupware package that includes Internet links — represents a return salvo to AT&T's Network Notes service. Such services shift traditionally premises-based LAN servers into the public network, where the carrier maintains them. ■

HOW TO REACH US

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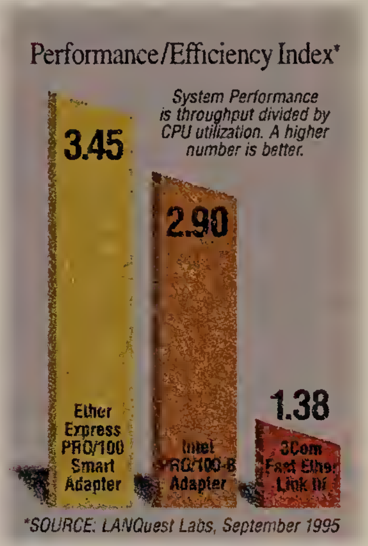

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Talk is cheap – at least over frame relay lines

By Tim Greene

Washington, D.C.

Users last week flocked to demonstrations of voice over frame relay at ComNet '96, and many came away ready to buy.

"I'm ordering equipment as soon as I get back," said Andrew Jarema, director of management information services for Airport Group International, Inc., which manages airport services and facilities.

The economics are a no-brainer: You transmit data over inexpensive frame relay lines and voice traffic rides free.

Too good to be true?

When weighing voice over frame relay, consider:

- Whether calls will be repeatedly compressed and decompressed at intermediary switches, something that can degrade voice quality.
- That frame relay pricing structures might change and reduce savings from running voice over it.
- Whether your carrier guarantees service quality to support voice.

For example, Jarema wants to link five key U.S. cities where the company has contracts. He found that the least expensive option was buying 56K bit/sec frame relay lines into the public network and aggregating them onto a T-1 line to headquarters in Glendale, Calif.

The price tag—$5,000 per month—is about what the company pays now for public telephone network calls among the five sites, he said. By running the voice traffic on frame relay, the savings will cover line costs.

While the means to carry out voice over frame have been around for years, it wasn't until recent improvements in voice quality and support for voice standards that interest grew.

When Ken Lund, the telecommunications manager for Allen Lund Co., a trucking firm in La Canada, Calif., entered a voice-over-frame relay beta test last year, the voice quality wasn't great. Lund said that after a few software upgrades from the vendor, Micom Communications Corp., the quality "is a lot better than we thought it would be."

Others agreed. "I would not have believed it could be that good at 4.8K bit/sec," Jarema said after talking over a demonstration line at ComNet.

With that kind of acceptance, voice over frame relay is drawing increasing attention from the Frame Relay Forum working group developing standards for the technology.

But some vendors, such as FastComm Communications Corp., are waiting for standards to be set possibly later this year before developing their own products. And some users are concerned about standards, too.

Michael Crawford, director of product marketing for Stallion Technologies, Inc. in Soquel, Calif., said he would like to see interoperability standards set so he can buy the least expensive option on the market.

When the Frame Relay Forum Technical Committee working group on voice over frame relay first met 16 months ago, about six people showed up, according to Bill Flanagan, marketing director at FastComm and a member of the working group.

When it met last month, about 70 people attended, including AT&T, Alcatel Network Systems, Inc. and Siemens Rolm Communications, Inc., Flanagan said. "Big players means there's something big to grab," he said. Carriers, their switch makers and the makers of private branch exchange voice switches have to pay attention to protect their businesses, he said.

Carriers could lose voice customers. Switch vendors might have to figure out how to switch packetized voice, and PBX makers would have to evaluate how their switches might fit into a frame relay network.

Carriers that offer voice as well as frame relay are understandably reluctant to customize their frame relay services for voice. But they may have to, as frame relay-only carriers like EMI Communications Corp. start offering quality-of-service levels specifically designed to give good voice quality.

If carriers want to hold on to new frame relay business, they may have to offer some voice quality guarantees. That scenario is playing out for Crawford, whose company wants to run voice over a 56K bit/sec line from it's California headquarters to an office in Brisbane, Australia. Several big carriers are vying for the deal, "and they're willing to negotiate voice to get the data business," he said. ■

Ascom Timeplex readies ATM network migration products

By Tim Greene

Washington, D.C.

Ascom Timeplex, Inc. this year will round out its product line with the addition of an ATM edge switch and a tool to integrate its huge installed base of multiplexers into frame- and cell-based backbone networks.

The products will fulfill an Ascom Timeplex promise to help users migrate from networks based on the company's LINK multiplexers to networks with cell switching at their cores. At the same time, users will be able to fully manage the muxes within networks built around the company's Synchrony family of switches.

The company in April will announce its ST-2000, an Asynchronous Transfer Mode edge switch with a 1.9G bit/sec backplane and an OC-3 ATM wide-area interface. It will support both User-to-Network and Network-to-Network interfaces specified by the ATM Forum, according to Ascom Timeplex President Randy Phillips.

Customers will be able to switch LAN, SNA and video traffic fed to the ST-2000 in a cell-stream from another Synchrony product. It also will be able to switch native traffic directly from an ATM LAN.

At the end of June, the company will introduce a module for the ST-1000 chassis that will interface with LINK muxes. The LINK Gateway Module will allow users to retain element management of the multiplexers within Synchrony networks.

In addition, the company last week at ComNet '96 introduced a larger model of its combination frame relay access device and X.25 packet switch. Called the BNP-350, it can have up to 18 serial ports.

Ascom Timeplex also announced that as of May, it will no longer sell the ST-50 access switch and the ER-15 router as separate units. Instead, they will be available only as modules on the ST-1000 chassis, where they will be available for less than the current price of either one, according to Hava Zernik, Ascom Timeplex assistant vice president of marketing.

The company wants to encourage users to move toward modular chassis that can be reconfigured as needs change.

Ascom Timeplex could not yet provide pricing for the ST-2000 or the LINK Gateway Module. The BNP-350 costs $4,500.

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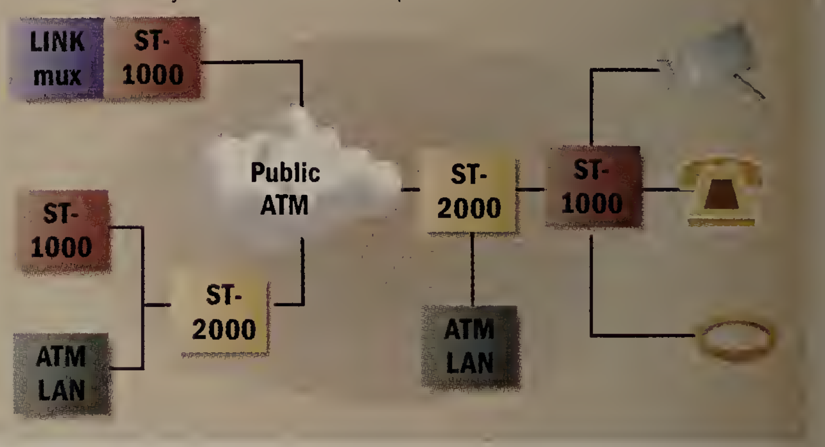
ASCOM TIMEPLEX'S ATM MIGRATION TOOLS

The addition of the ST-2000 edge device allows switching of all LAN traffic over an ATM WAN. The company is also enhancing the ST-1000 backbone switching node to tie directly to installed LINK multiplexers.



Sprint launches global venture

By David Rohde

Washington, D.C.

Sprint Corp. last week launched its long-awaited global joint venture with France Telecom (FT) and Germany's Deutsche Telekom (DT), dubbing it Global One.

Although the venture had been delayed due to the arduous regulatory approval process, Global One will attempt to hit the ground running by lashing together the existing voice and data networks of the three partners.

Most notably, DT's Datex-P and FT's Transpac packet data networks will be combined with Sprint International's global presence to deliver services such as global X.25.

Global One will use the X.75 protocol, which provides gateways among X.25 networks, to integrate Sprint International and Transpac nodes, according to Domenick DeAngelo, Sprint's vice president of data product management.

"Sprint International basically is Sprint's contribution to Global One," said Kevin Brauer, president of Sprint's Business Services Group, at a press conference here.

But because of regulatory restrictions imposed on the venture, only the portions of the European carriers' data networks outside their home countries will be included in Global One.

Soup to nuts

Key offerings expected from Global One:

- Virtual private network
- Global phone card
- Enhanced fax
- X.25 service
- Frame relay
- Managed bandwidth (private lines)
- VSAT service
- EDI

The Datex-P and Transpac units in Germany and France will be integrated in Global One only after Jan. 1, 1998 — the date on which all European carriers must open their markets to full competition.

To compete with global virtual private network offerings such as Concert's Global VNS, FT's VPN network will be migrated to Global One. This will result in initial availability in 11 countries, according to Barbara Blanck, Sprint's vice president of global sales support. Concert is an MCI Communications Corp.-BT joint venture.

Officials with Sprint, FT and DT said they have been working feverishly to unify the characteristics of and billing procedures for feature-rich services such as VPN.

"We have done a tremendous amount of integration," Blanck said. ■

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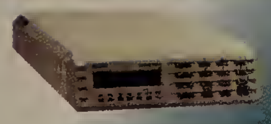

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WordPerfect sells at Novell fire sale

By Kevin Fogarty
Orem, Utah

Novell, Inc. last week announced that a deal with Corel Corp. ended its search for a buyer for WordPerfect — a move that could alter the very nature of the software line.

While Corel has committed to keeping the hooks between the PerfectOffice suite and NetWare and GroupWise, the new owner seems more keen on touting its upcoming Web compatibility. Both companies will work on the development of NetWare and GroupWise integration, although what enhancements are coming and which company will build them is unclear.

The Web plans are less murky. In fact, the new PerfectOffice suite will ship in April with extensive ties to the Internet, said Michael Cowpland, chief executive officer of Corel.

The WordPerfect package will boast a built-in Web browser, the ability to save documents as HTML documents without doing any coding and the capacity to convert older WordPerfect documents to HTML, Cowpland said.

The Quattro Pro spreadsheet will be able to have any cell access a Web site for data.

WordPerfect Presentations users will be able to output slides as Web pages transparently, Cowpland said. Those features, plus the rise of the Internet as a platform, will help PerfectOffice gain market share, Cowpland argued.

In return for the WordPerfect software line, both existing and upcoming versions, Novell will receive $10.75 million in cash and 9.95 million shares of Corel stock worth about $113.2 million.

Corel also is licensing the client for Novell's GroupWise electronic mail package and NetWare connectivity software for five years. That deal will add approximately $70 million in payments to Novell during the course of the agreement, according to Jim Tolonen, Novell's chief financial officer.

The deal looks like a major loss for Novell, which agreed to a $1.4 billion merger with WordPerfect in 1994. But by the time that deal was closed, WordPerfect stock had dropped so far it was only worth $855 million. Quattro Pro, which Novell acquired from Borland, Inc. for $145 million, was included in the sale, bringing the total Novell paid to exactly $1 billion.

However, Novell is selling only part of what it acquired, said Robert Frankenberg, CEO of Novell. His company will keep GroupWise and the document management, calendaring, scheduling and document viewing technology it acquired from WordPerfect.

The upshot is Novell got an E-mail and groupware product for about $800 million, compared to the $3.5 billion IBM paid for Lotus Development Corp., largely to get Lotus Notes. ■

Buy high, sell low

Novell has unloaded most of the properties bought by Ray Noorda in his last days with the company, but that streamlining has cost dearly.

Business acquired	Unix System Labs	WordPerfect
Purchase date	1992	1994
Purchase price	$360 million	$1 billion*
Sale date	1995	1996
Sale price	$60 million	$124 million plus royalties
Net loss	$300 million	$876 million

*$855 million in depressed stock and $145 million for Quattro Pro

GroupWise gains a link to the Internet

WebAccess gives customers access to messaging features via popular Web browsers.

By Carol Sliwa
Orem, Utah

Internet fever finally has gripped Novell.

The company last week announced GroupWise WebAccess, a product that will let users of its groupware software access electronic mail, voice mail messages, faxes, calendar views and other GroupWise functions from a simple Web browser.

Anyone forgetting a laptop while on the road would just have to find a PC with a Web browser. Since WebAccess is server-based, no software need be installed at the desktop.

"If I'm in a university environment and I need to provide E-mail support for 30,000 users, it's nice to not have to configure 30,000 workstations. I just install the server," said Eldon Greenwood, director of product management for Novell's groupware division.

The end users simply need a GroupWise account, an Internet or intranet connection, and an HTML 1.0-compliant Web browser. They then can access the GroupWise Universal In Box by locating the GroupWise home page, clicking on the GroupWise graphic to get the logon box, and entering a user ID and password.

The user interface is not identical to the regular GroupWise interface, and users will not be able to drag and drop items into folders. But the environment is similar, Greenwood said.

On the back end, Novell's NetWare customers running a NetWare Loadable Module-based HTTP server will need only one box since GroupWise WebAccess can run on the same machine with NetWare, the NetWare Web server and the GroupWise message server.

Companies also can run the WebAccess HTTP component on a Unix, Windows NT or OS/2 Web server alongside another machine running the WebAccess messaging server and GroupWise Post Office.

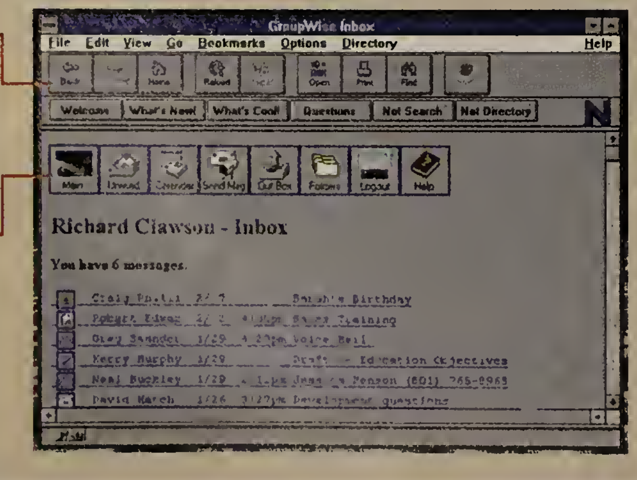
Randy Blaschke, a systems engineer for American Airlines, Inc., said the company is eyeing GroupWise WebAccess as a low-cost option for field personnel to access corporate data over an internal net. The alternative is installing GroupWise clients on PCs for 90,000 users, he said.

WebAccess, scheduled for release in the second quarter, will work with GroupWise 4.1 and GroupWise XTD.

A 10-user pack costs $249 and a 100-user pack costs $1,199. Companies with 100 or more GroupWise licenses can buy WebAccess licenses for $1,999.

© Novell: (801) 429-7000.

GROUPWISE WEBACCESS



Richard Clawson - Inbox

You have 6 messages.

GroupWise functions can be accessed through any Web browser.

Users see the same icons that they would in their GroupWise clients, although the interface is different.

Novell hands off work on its multivendor Tuxedo TP monitor

By John Cox
Orem, Utah

Novell, Inc. last week carved up its Tuxedo transaction processing (TP) monitor business with an eye toward better exploiting the product's distributed computing features across NetWare networks.

The company has reserved for itself the work of integrating Tuxedo with the key features of the NetWare network operating system, including NetWare Directory Services (NDS), and developing NetWare-based transaction services. But it has dished out to BEA Systems, Inc., a high-powered Sunnyvale, Calif.-based start-up, the responsibility of driving Tuxedo into multivendor, distributed computing networks.

As a TP monitor, Tuxedo controls interactions over a network among applications and databases to ensure reliable communications and data integrity. Novell has been packaging Tuxedo with a range of communications technologies, including remote procedure call and messaging tools, to support distributed applications. Novell plans to incorporate Tuxedo services into a suite of high-level APIs, called Net2000, it announced last fall. And work is under way to link Tuxedo seamlessly with NDS.

BEA will develop, sell and support Tuxedo for Unix and Windows NT platforms, as well as for IBM's MVS mainframes, SP2 parallel computers and Application System/400 mid-range computers. A key part of BEA's plan is extensive consulting and support services to help customers put together complete, tailored Tuxedo systems quickly. Most of Novell's Tuxedo development, marketing and support staff will be switching to BEA.

Handing off some Tuxedo development is one of the latest moves by Novell to shed product groups in order to refocus its energies on network computing infrastructures. In weighing the future of Tuxedo, Novell saw that customers of the technology are typically building enterprise-scale application systems, which is not Novell's strong suit, said Michael DeFazio, senior vice president of Novell's Systems Group. But BEA was formed to address precisely that market, said William Coleman, president and chief executive officer of the company. BEA was launched less than two years ago with the goal of acquiring products and consulting expertise around Tuxedo to build large-scale distributed systems to support core business operations.

"Tuxedo is really a middleware solution, and the market for this type of technology is really the client/server applications market."

Joe Menard

"We're focusing on Tuxedo not only as a transaction processing system, but as a [system for] distributed application management and services," Coleman said.

Distributed applications — and TP systems, in particular — remain stubbornly hard to deploy and control. Novell has tried to address the issue by integrating more than 50 development tools with Tuxedo services, said Joe Menard, vice president and general manager of Novell's Tuxedo Systems Group. The company has added a graphical management interface as well as links to widely used systems and network management platforms.

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Compaq was awarded
99 U.S. patents,

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Net mgmt.

Continued from page 6

lated any road map or plan for what they would do with the NMC technology."

The low level of SNMP support in SMS 1.2 shows Microsoft is seriously lagging in developing net management, said Jonathan Niednagel, senior product manager for Norton Administrator for Networks at Symantec, Inc.

"They were talking about a fairly grandiose release this year, and that got scaled way, way back," Niednagel said.

Microsoft is encouraging third parties to add NT support to their management products, positioning SMS more as a platform than as an application, said Mark Christensen, co-general manager for Intel Corp.'s network products division.

Rick Kreysar, vice president of marketing for McAfee, agreed. "I think they are leaving the door open for people like us to provide applications to what, in essence, would be an SMS infrastructure," he said. McAfee is working on a version of its management products that will plug into SMS.

Web control

If Microsoft is lagging in network management, it is surging ahead to add hooks in SMS to manage its upcoming Internet Information Server (IIS), Holden said.

The upcoming SMS 1.2 will include the ability within SMS to identify Web events, monitor the performance of IIS and generate SNMP traps when thresholds are exceeded.

It is also possible that Microsoft will position the database SMS will use to identify Web events as a potential standard, Holden said.

A version due for beta late this year will include extensive Web hooks. These possibly will include the ability to manage Web mirror sites to be sure the data on them is synchronized, to load-balance between two sites, and to remotely inventory and diagnose problems on clients using the Web as an interface and access mechanism, according to Holden. ■

Apple

Continued from page 1

ing operations available for the Intel platform, and this has caused corporate interest in the Macintosh to dry up.

"We've been two-thirds Macintosh, but the PC platforms are cheaper and there are more Windows products," said Andy Reho, a manager in distributed systems technology at The Mitre Corp. in McLean, Va., which has more than 5,000 users.

That problem has become self-perpetuating. For third-party developers, it's a matter of market share: The Intel platform is a bigger opportunity.

And as Apple looses share due to a lack of product options, fewer developers can afford to take a flyer with the Macintosh platform.

Apple has taken some pains to solve the problem, but nothing, it seems, has worked. For example, Apple for several years has bundled TCP/IP with every system, but the proprietary AppleTalk remains the easiest way to link Macintosh systems.

"Apple's peer-to-peer communications solution is one of the best," said Rob Enderle, senior analyst with GIGA Information Group in San Jose, Calif. "But it's for small, isolated organizations. Apple's completely missed the client/server phenomenon."

Apple's answer, the Open Transport communications translation layer, was delayed from its early 1995 release and first shipped on new PowerBooks late last summer. A beta release of the more stable Version 1.1 is now available to developers.

But Open Transport will not be widely available until the release of Copland, the next version of the Macintosh operating system, which has been delayed several times and is now scheduled to ship midyear.

Other Apple networking ventures were initially promising but faltered. Among them:

- ■ Development of NetWare for the Macintosh, shared by Apple and Novell, Inc., was dropped last year in favor of a version for the Common Hardware Reference Platform jointly developed by the Power PC team of Apple, IBM and Motorola, Inc.
- ■ New servers running Unix were victim to recent funding cuts.

National Semiconductor CEO Gilbert Amelio (at right) took over as Apple's chairman and CEO Friday, less than two weeks after longtime Apple executive A.C. "Mike" Markkula declared that beleaguered Apple CEO Michael Spindler "has the full support of this board." Markkula will switch from chairman to vice chairman under Amelio.

In addition, Apple has offloaded some products. For example, it sold its Macintosh-to-mainframe division to Wall Data, Inc., which continues to develop the technology.

But when Apple ships network technology, it is usually well received. Reduced Instruction Set Computing-based Macintosh servers have sold well, but users expected new models in 1995. Apple promises to ship new hardware this quarter, said David Nagle, Apple's vice president of research and development.

That Apple delayed a lucrative product "is symptomatic of Apple's problems," noted Pieter Hartsook, publisher of the market analysis report "The Hartsook Letter" in Alameda, Calif. "Spindler was looking at the consumer market and not refreshing the server business. Apple needs a business unit focused on the enterprise market."

Keeping the faith

Despite recent troubles, Apple's faithful are typically optimistic. "Apple's been through tougher times than these," said John Wimer, director of operations for Norian Corp., a Cupertino, Calif., pharmaceutical company standardized on the Macintosh. "But they need to deliver everything on schedule: System 7.5.3, Copland, CHRP and OpenDoc, and increase their connectivity to the Internet."

Apple agrees about the 'Net and sees a big opportunity in that market (*NW*, Jan. 15, page 1). Former CEO Spindler said 38% of Macintosh server sales are already for the Apple Internet Server Solution, a hardware/software bundle. ■

Cabletron

Continued from page 1

support the higher speed digital dial-up technology.

But Cabletron has some catching up to do. Competitors 3Com Corp., Bay Networks, Inc. and Cisco Systems, Inc. already offer products in the ISDN space. Still, analysts said Cabletron's timing is fine given that ISDN is just starting to hit its stride as a remote LAN connectivity option.

The new offerings also will make Cabletron less reliant on Xylogics, Inc., which provides much of Cabletron's remote access gear but was acquired by rival Bay last year.

"The terminal server and analog dial-in markets will go away over time and will be replaced by high-end switching and ISDN."

Wade Appelman

What will be different about Cabletron's ISDN offerings is that they will be integrated with the company's SecureFast Virtual Networking services, which provide policy-based management, call management and call accounting features that allow network managers to more easily keep track of remote users.

Using policy-based management to track software licenses appeals to Cabletron user Patrick Laughran, director of network services at Babson College.

"We have a software licensing agreement with Microsoft that allows faculty members to use Microsoft Office over the LAN as well as from home, but the students are not allowed to access it remotely," he said. "So if we were able to get policy-based management in place, we could easily identify users as they dial in and determine what resources they are entitled to."

In addition, users said the call accounting feature will allow net managers to monitor remote access usage and bill the departments accordingly.

Wade Appelman, a product marketing manager at Cabletron, said the company is currently developing ISDN modules for its Multi Media Access Center wiring closet hub and MMAC-Plus backbone chassis to be used at the corporate headquarters.

Cabletron also will offer smaller stand-alone and stackable workgroup devices for remote sites. Appelman hinted that the company plans to offer a 12-port concentrator module with an ISDN Basic Rate Interface or Private Rate Interface connection. End users at the remote site would funnel their traffic through this 12-port module and over an ISDN line to a telephone central office, where the traffic could be consolidated and sent on to the corporate LAN via a T-1 line.

User wish list

Customers would like Cabletron's new suite of ISDN remote access devices to offer:

- ▶ Policy-based management support
- ▶ High-level security/authentication features
- ▶ Call-accounting capabilities
- ▶ The ability to be managed centrally from a single platform
- ▶ Competitive pricing

The key to offering these remote access devices is Cabletron's relationship with Northern Telecom, Inc., Pacific Bell, NYNEX Corp., AT&T and BellSouth Corp., Appelman said.

Cabletron plans to team up with these carriers and equipment makers to offer remote access product and service packages that allow users to get ISDN service through one of the carriers, central office equipment from a company such as Nortel and then deploy the Cabletron gear at their own site.

Customers will be able to use Cabletron's Spectrum network management platform to manage remote access devices and private branch exchanges, as well as LAN and WAN connectivity, Appelman said.

Cabletron user Ken Cieszynski, staff engineer at United Air Lines, Inc. in Chicago, said he is concerned about how to manage a large pool of modems and other remote access equipment.

"If Cabletron can come up with a means to provide the management and the integration with their product line, that would be great," he said. "I'm considering Shiva's LANRovers or going through a third party, but I'm not sure what type of management I'll be getting."

Barbara Maaskant, director of information services at the Rollins School of Public Health of Emory University in Atlanta, is exploring remote access options but isn't sure about ISDN.

"We are intensely interested in improved remote access because we have the Olympics coming to Atlanta and we anticipate that a lot of folks will want to telecommute in order to avoid the traffic congestion that goes along with the event," she said. "But I'm worried that ISDN will be a particularly costly solution."

Although several regional Bell operating companies are working to raise ISDN service rates, Appelman said he figures ISDN prices will drop considerably by year-end, which is when the Cabletron products are expected to be available.

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Congress

Continued from page 1

Commerce Committee Chairman Larry Pressler (R-S.D.), who guided the bill around dozens of political land mines, hailed it as an opportunity to create "tens of thousands of new jobs each year." But the prospect of new competition is already costing tens of thousands of workers their jobs as companies like AT&T streamline their operations.

Commerce *Committee Chairman Larry Pressler says the bill will create 'tens of thousands of new jobs each year.'*

The bill, which cleared the Senate 91-5 and the House of Representatives 414-16, takes effect upon President Clinton's signature, expected this week. Stalled for months in a House-Senate conference committee after the two chambers passed different versions last year, the final bill sailed through once Senate Majority Leader Bob Dole (R-Kan.) dropped objections to provisions seen as benefiting big television station owners.

One big plus: The bill promises to break the access bottleneck by promoting competition in local services. The bill forces RBOCs to begin negotiating with competitors to fully interconnect their networks. RBOCs must also allow alternative carriers to resell their services, though the bill stops short of setting rates.

Long-distance carriers and users who seek cheap, broadband local access hope another provision of the bill — allowing cable companies to enter the phone business — will scare the RBOCs into negotiating terms quickly.

"We hope that this bill acts as a catalyst and an epiphany for the RBOCs," said Gerry Salemme, AT&T's vice president for federal regulatory affairs.

The bill allows RBOCs to enter the long-distance business, but only after running a gauntlet of preconditions that observers expect may take several years. Yet key data services executives at long-distance companies expect RBOCs to do whatever it takes to become bigger players in the lucrative enterprise net market.

A key question is how fast can the FCC move to write the required new rules. The bill forces the agency into rulemakings on everything from who pays to connect rural and low-income customers to public networks, to who gets which telephone numbers.

"There's an 18- to 24-month hell for the agency to go through," said Blair Levin, a top assistant to FCC Chairman Reed Hundt.

But analysts do not expect carriers to wait for the final regulations before diving into mergers and alliances. "Expect to see Baby Bells merging with each other and with long-distance carriers," said Jeffrey Kagan, president of Kagan Telecom Associates, an Atlanta consulting firm. Second-tier long-distance carriers — LDDS WorldCom, Frontier Corp. and LCI International, Inc. — will be early targets, he said.

Don't look for prices in general to drop in the near future, said the FCC's Levin. "The initial competition will not be on price," he told a session at last week's ComNet '96 show here. "It will be on bonding, branding and bundling of products."

But a little-noticed section of the bill may make it easier for users to negotiate prices with carriers. The section allows the commission to sweep away regulations, such as the requirement for carriers to file legally binding tariffs.

AT&T's Salemme said he does not expect the FCC to take advantage of this authority immediately, given its crushing new workload and the fact that the commission just ordered carriers to file frame relay tariffs. However, both he and James Blaszak, a prominent attorney here for several user groups, suggested that the new law could eventually enable the FCC to end rate regulation on the entire long-distance market. ■

This is deregulation?

How soon telecom reform benefits users depends on how quickly the FCC moves to issue rulemakings putting the bill's mandates into force. But the FCC has a lot of work ahead:

- ▷ Number of pages in the bill: **280**
- ▷ Number of new FCC rulemakings* required: **58**
- ▷ Current yearly FCC budget: **$175 million**
- ▷ Minimum budget required, according to FCC Chairman Reed Hundt: **$185 million**

*A rulemaking is a formal process requiring procedures such as advance notice and comment periods.

SOURCES: HOUSE COMMERCE COMMITTEE AND THE FCC, WASHINGTON, D.C.

Ya gotta do what ya gotta do

RBOCs must meet the following local network conditions before entering into the long-distance business in their region:

1. Provide interconnection with competitors' networks.
2. Give competitors access to individual network elements without requiring purchase of others.
3. Allow competitors access to poles, ducts, conduits and rights-of-way.
4. Provide unbundled transport from the central office (CO) to customer premises.
5. Provide unbundled transport from the CO out to long-distance carriers.
6. Provide switching unbundled from transport options.
7. Give competitors access to 911, directory assistance and operator call completion.
8. Agree to list competitors' customers in the white pages.
9. Give competitors telephone numbers to assign.
10. Give competitors access to network databases and associated signaling.
11. Provide certain, though not all, types of number portability.
12. Provide dialing parity so competitors' customers don't have to dial extra digits.
13. Agree to compensate competitors for completing phone calls to their customers.
14. Allow resale of RBOC services.

SOURCE: TELECOMMUNICATIONS ACT OF 1995

Q&A

Continued from page 1

to get local network services from a local exchange carrier such as a regional Bell operating company and long- distance services from an established long-distance carrier.

What are the exceptions?

First, long-distance carriers and others can immediately start negotiating with RBOCs to resell local service. Second, RBOCs can immediately apply to offer long-distance service outside their own territories. In other words, NYNEX Corp. could offer long distance in California but not in New York. Third, RBOCs gain the flexibility to complete wireless connections beyond the boundaries of their regional calling areas, or local access and transport areas.

Doesn't the bill open up all telecommunications markets to all carriers?

Yes, but it does so by ordering the Federal Communications Commission to write regulations under a formal process called rulemaking. Such a process normally takes at least a year, if not much longer, and can be dragged out by appeals. And the FCC does not have the staff to start all the rulemakings at once.

Which will come first: the opening of the local market or the local carriers entering the long-distance business in their own regions?

Almost all experts agree that local competition will come first. Analysts at Salomon Brothers, Inc. estimate that RBOC entry into long distance will lag local competition by two to three years.

Why so long?

Under the bill, RBOCs must leap three hurdles before entering the long-distance market in their own region: First, they must meet a checklist of 14 items for local competition (see graphic, this page). Then they must demonstrate that they have a "facilities-based" competitor — not just a local reseller — in their markets.

Finally, they must convince both the FCC and the Department of Justice that it is in the public's interest for the RBOC to go into long distance.

Still scratching your head about how telecom reform will affect you? Grab a greatly extended version of our Q&A on Network World Fusion.

Network World Fusion http://www.nwfusion.com

Must the RBOC demonstrate that the facilities-based competitor has a complete physical local network rivaling its own?

No. The condition is met if the competitor has installed some switches and laid some fiber, giving it the ability to carry some traffic while handing off the rest to the RBOC.

I'm in a big city where there's already a competitive access provider with switches and fiber. Does that meet the test?

Probably not. RBOCs must show they have competition generally in a given state. For example, in Massachusetts, NYNEX may have to show it has competition in Springfield and Boston.

This all sounds pretty tough on the RBOCs. Last fall, they were pushing hard for the bill while the long-distance carriers loudly opposed it. Did something change since then?

Yes. Originally, the Senate passed a bill that included the 14-point competitive checklist and the FCC public-interest test. Then the House passed a bill containing the requirement for a facilities-based competitor. Then Vice President Al Gore and other Democrats pushed hard for the Justice Department to have a say.

Instead of choosing among these options, the House-Senate conference committee that wrote the final draft simply included all of them.

What if my state has already authorized local competition?

So much the better. State regulators won the right to keep most of their rules and to participate in the making of the federal rules. For example, state agencies have the primary responsibility for certifying that the 14-point checklist has been met.

Can one RBOC now buy or ally with another?

Yes. But even the merged company would have to operate under the old regulations — essentially carry user traffic only within LATAs — until it is certified as meeting the conditions for long-distance competition.

Does the bill specify the wholesale rates at which RBOCs must provide services to a reseller such as AT&T?

Not quite. The RBOC must offer the services to resellers either at retail rates less the cost of providing the service to end users or at the actual wholesale cost plus a reasonable profit. But the bill doesn't specify percentage discounts.

Will I save money under these formulas if I use a local reseller?

Probably not at first. Certain states' experience in local-loop resale have resulted in little savings, experts said.

—*David Rohde and Ellen Messmer*

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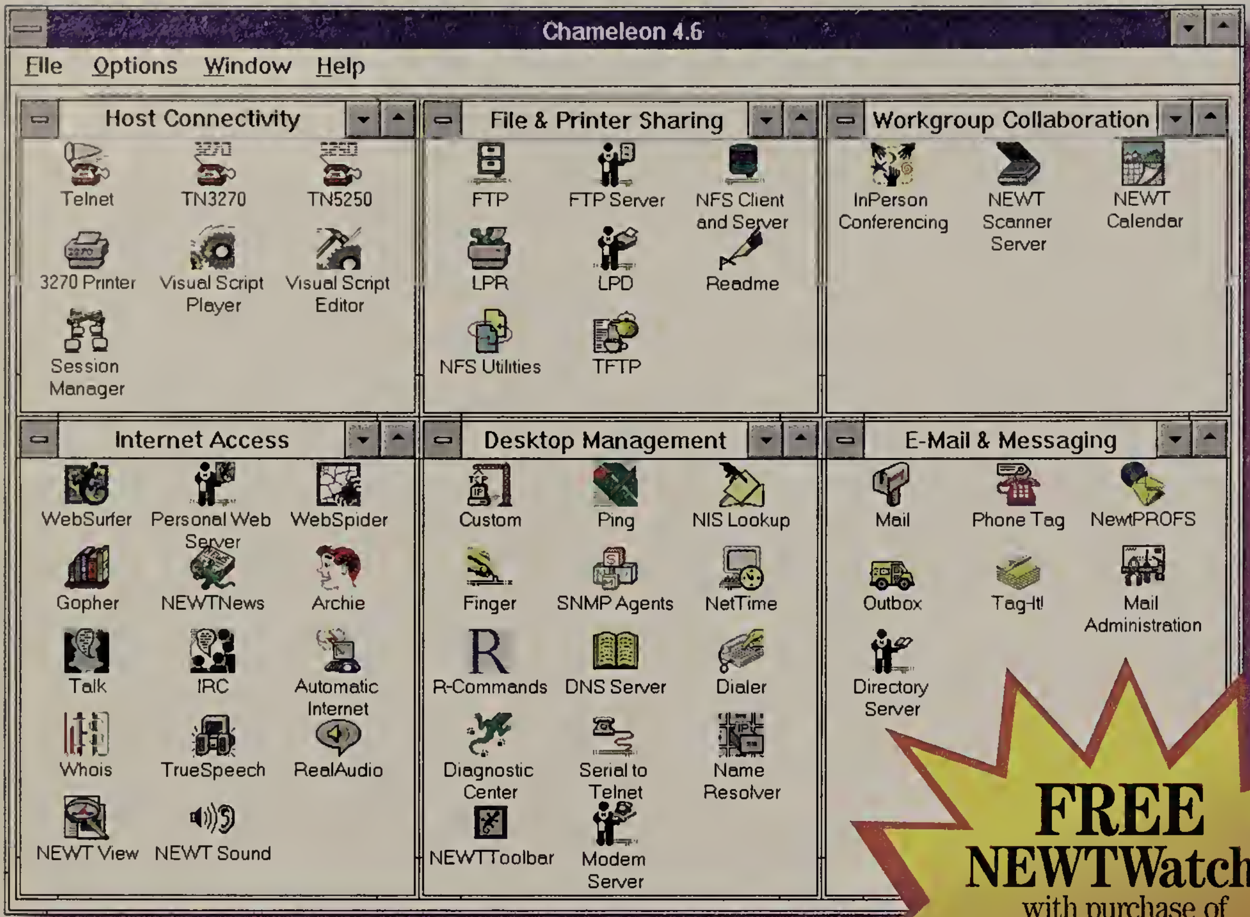

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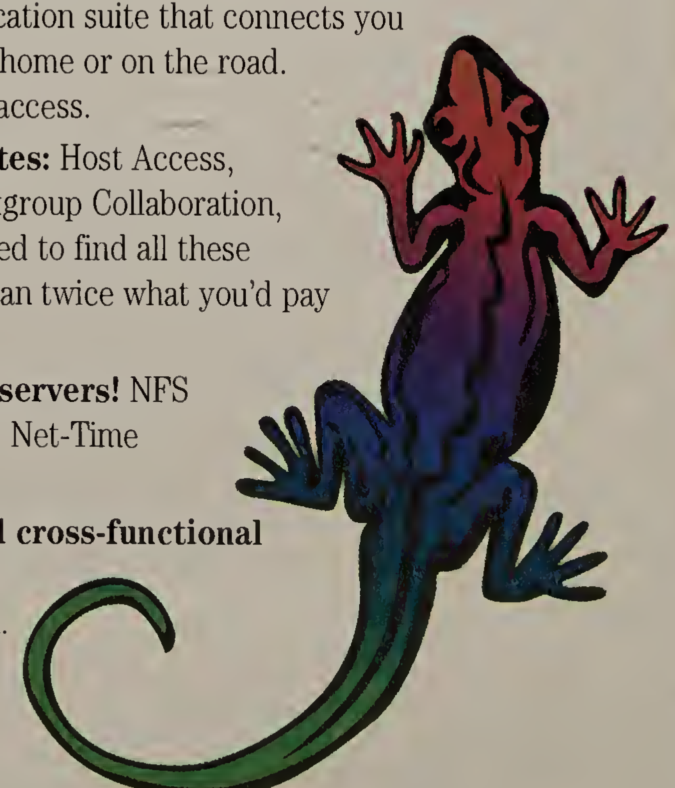

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Briefs

■ *The Federal Communications Commission has proposed to* **fine AT&T, MCI Communications Corp. and three other carriers** *a total of $320,000 for alleged* **"slamming"** *— the practice of switching customers to a different carrier without their explicit permission. Most of the charges involved signatures on forms that did not match the actual customer's handwriting. AT&T and MCI both said they condemn slamming and will pay the fines pending further investigation. MCI blamed the problem on a third-party agent.*

■ **AT&T** *has announced it will* **close all 338 of its AT&T Phone Center stores.** *It will now sell all its consumer telephone products through chain stores, catalog retailers and communications service providers. About 2,500 employees are expected to be left without jobs.*

■ **Sprint Cellular** *will adopt a* **new name** *— 360° Communications Co. — in conjunction with its pending spin-off from parent Sprint Corp.*

■ **CompuServe, Inc.'s Network Services Division** *has signed an agreement with France Telecom Network Services to provide 28.8K bit/sec dial-up access services to the CompuServe network throughout much of Europe. Access will be provided through France Telecom's managed network, which reportedly comprises more than 1,000 nodes spanning* **17 European countries.**

In addition, CompuServe is now offering dedicated frame relay access to its Enterprise Connect for Lotus Notes service.

■ *Wireless network operator* **ARDIS Co.** *is now offering parent Motorola, Inc.'s AirMobile Wireless Software for Notes — middleware that enables the mail component of* **Lotus Notes 3.31 to run over the ARDIS network.** *ARDIS already offers the cc:Mail version of AirMobile.*

MCI eases SNA over frame relay

By David Rohde

Washington, D.C.

MCI Communications Corp. is planning enhancements to its HyperStream frame relay network to make it easier for users to send SNA traffic over frame relay.

The move is aimed at wresting data network business away from AT&T, though several of the key solutions are not expected to be available for many months.

For example, the carrier said it will offer a service later this year to manage frame relay access devices (FRAD) that are frequently used in SNA-to-frame conversions. Such a service is already available from Sprint Corp.

But in a move that analysts said has not been attempted so far by Sprint or AT&T, MCI will implement a native-mode Synchronous Data Link Control (SDLC) service within its own

See MCI, *page 18*

Cost of remote access clouds appeal

Users are scrambling to devise plans to reign in unexpected remote access costs.

By Jim Duffy

Failing to plan is planning to fail.

This axiom holds true not only in the business world, but in the realm of remote network access, too.

Companies risk paying some heavy penalties if they underestimate usage of their remote LAN and Internet access links, or fail to keep a close eye on their carriers. These surprises are in addition to the hidden costs of remote access, which include time spent configuring devices and training end users.

"We're just to the point of beginning to learn how to effectively manage [remote networking]," said Carroll Perkins, senior network engineer at Westinghouse Corp. Information Services in Pittsburgh. "If you mismanage it, you're going to have a lot of extra costs."

The First National Bank of Maryland found out the hard way.

"One time, we had a gentleman in upstate New York who was dialing in [to a server] getting quotes from his hotel room at night, and then going out and visiting customers the next day," said Glenn Sellers, senior telecommunications transmission engineer at the Baltimore-based bank. "Within a week's time, he ran up a $2,000 phone bill. When we saw that, it was like, 'Oh, my Lord! Let's do something to correct this problem.'"

The bank did just that. It set up a private 800-number network to keep out-of-state long-distance costs from spiraling out of control. After that, costs dropped dramatically. For example, Sellers said the phone bill for one executive who was out of the country for two weeks was only $279, which accounted for international charges. Once connected in the U.S., the calls were free.

ADC Telecommunications, Inc. of Minneapolis also discovered the pain and sticker shock of linking users in a recently acquired Australian manufacturing firm to the corporate net in the States.

"We looked at the cost of getting dedicated circuits overseas, and they were fairly expensive," said Roy Hegge, senior network engineer at ADC. "So we put in ISDN. It turned out that our first bill was $25,000, which is about eight or 10 months' worth of frame relay. So we could have paid for eight months of frame relay for what we paid for one month of dial-up ISDN."

Needless to say, ADC converted those lines, but Hegge cautioned that international access circuits need to be managed and monitored carefully to avoid unexpected spikes in carrier charges. In Belgium, for instance, ADC once paid the equivalent of two or three months of dedicated 64K bit/sec frame relay service for one month of poor dial-up connectivity for electronic mail, he said.

"We're beginning to spend more time managing those dial-up circuits and trying to get people to convert [to leased lines]," Hegge said. "It's worth $3,000 a month to have dedicated bandwidth to our corporate network."

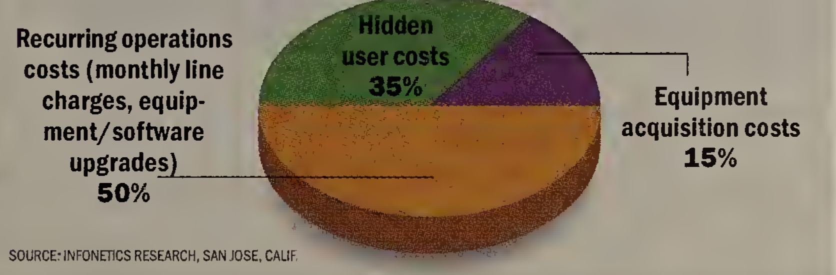
Hidden costs

Even if companies factor in the cost for equipment and services to help make branch office

See Remote access, *page 18*

Corporate waste

About 35% of remote access expenditures cover hidden costs such as time spent installing, configuring and troubleshooting equipment. The findings are based on a survey of 161 companies that spent an average of $4.79 million on remote access in 1995.



SOURCE: INFONETICS RESEARCH, SAN JOSE, CALIF.

Data TeleMark extends range of ISDN service

By Tim Greene

Washington, D.C.

Targeting users frustrated by the limited range of ISDN, Data TeleMark L.C. this week will introduce an ISDN product that can extend the service over virtually any distance.

The DICA 6400 Universal converter, to debut at the Satellite '96 show here, will extend ISDN along any digital transport, including dedicated line, microwave and satellite.

Because the range of ISDN Basic Rate Interface service is limited to 18,000 feet, it is unavailable in many areas or is only possible with the use of repeaters — often at a higher rate.

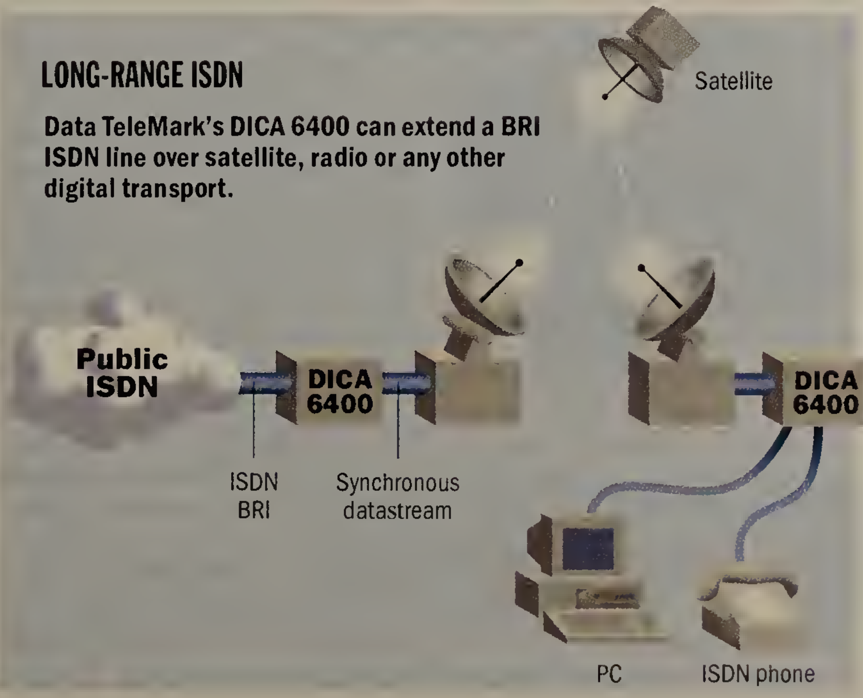
With the DICA 6400 connected to an ISDN BRI line on one port and long-haul digital transport on another, the full features of the ISDN service can be extended to the remote location. A second, remote DICA 6400 receives the digital signal and interfaces with devices equipped with ISDN NT-1, including PCs, videoconferencing systems and phones.

The box can support up to 12 individual BRI lines or can inverse-multiplex up to four BRIs into a single 512K bit/sec channel.

See ISDN, *page 18*

LONG-RANGE ISDN

Data TeleMark's DICA 6400 can extend a BRI ISDN line over satellite, radio or any other digital transport.



Nortel puts Magellan on T-1 track

By David Rohde
Dallas

Northern Telecom, Inc. has announced a T-1 interface for its Magellan Passport ATM switch that provides a way to use the company's bandwidth allocation technology at a lower speed.

The move allows managers to concentrate voice, data and video through the switch onto a single leased T-1 pipe within a private network or directly into a carrier's public Asynchronous Transfer Mode service.

Although not the first enterprise ATM switch vendor to support a T-1 interface, Nortel's move presents some unique opportunities for cost savings, according to customers and analysts.

Although not the first enterprise ATM switch vendors to support a T-1 interface, Nortel's move presents some unique opportunities for cost savings, according to customers and analysts.

That's because Magellan Passport uses dynamic bandwidth allocation to allow all types of traffic — including voice — to fly through according to a variable bit rate (VBR) scheme.

In effect, the Passport looks for holes in a telephone conversation — pauses in speech patterns — to squeeze more data traffic through the same channel. Most competing ATM architectures lock up delay-sensitive voice traffic into a constant bit rate stream, reducing the efficiency of the channel and requiring additional bandwidth.

But the benefit of Nortel's dynamic bandwidth allocation has proven of little consequence with the typical T-3 ATM interface, rendering the exact allocation method unimportant except for customers generating close to 45M bit/sec of traffic.

T-1 support will enable companies to replace a fully depreciated T-1 multiplexer with the Passport and bring utilization rates on an existing T-1 access pipe down from 80% to 50%, even with ATM's notoriously high overhead, said Doug Kaye, Nortel's Magellan marketing director. That can provide a much-needed breather before facing the need to buy more access bandwidth for a given network node, he said.

"Doing voice over VBR makes sense from the standpoint of gaining the efficiencies of ATM," said Beth Gage, a broadband services analyst for TeleChoice, Inc., a consulting firm in Verona, N.J.

"[But] Nortel has needed to have a T-1 ATM interface for a while," Gage added.

The T-1 support is also designed to help managers of strictly data networks concentrate their traffic more efficiently.

✆ Nortel: (800) 466-7835.

MCI

Continued from page 17

carrier network. SDLC is the data link protocol used to manage information exchange between SNA peripheral equipment such as cluster controllers and host-attached communications controllers.

The goal, according to MCI, is to alleviate the need for a FRAD or other equipment on the customer premises to perform SDLC-to-frame relay conversion. MCI will achieve this by placing the FRAD in front of the frame relay switch in the carrier net, said Christine Heckart, senior broadband services analyst at TeleChoice, Inc., a consulting firm in Verona, N.J.

For users that instead decide to place a FRAD on premises for use under a managed service, MCI said only that it has selected FRAD vendors and the program will be made available to customers "within the next several months." Sprint Corp. already has a managed FRAD service available using devices from Sync Research, Inc. *(NW,* Oct. 9, 1995, page 17).

MCI also announced it had signed a joint market arrangement with Memorex Telex Corp. Under the two companies' joint offering, SNA customers using Memorex Telex's 1174 or 9300 Internetworking platforms can connect directly to HyperStream without deploying FRADs. Both the 1174 and 9300 platforms were recently certified to operate on the HyperStream service.

Separately, MCI officials said they are planning to make frame relay service generally available through value-added resellers and independent systems integrators. ■

New routers prepped for remote access fight

By Jim Duffy

Three router vendors have unleashed new weapons in an assault on rivals in the crowded battlefield known as the remote access market.

Advanced Computer Communications, Inc. (ACC), Compatible Systems, Inc. and Motorola, Inc. unveiled access routers, each with its own high points ranging from redundant WAN connectivity to legacy network integration, security, and built-in upgrade and migration paths. The products are designed to offer a solution to almost any remote access application and, thus, keep users from considering competitive offerings when new access requirements emerge.

ACC rolled the Colorado and the Colorado Plus routers. Both products have the ability to interface legacy network equipment and transport that data together with LAN traffic over the same wide-area connections, ACC said.

Colorado is available with an Ethernet or a token-ring LAN interface, and supports as many as three WAN connections and an optional ISDN Basic Rate Interface. Colorado Plus supports all the features of Colorado but sports two Ethernets, or an Ethernet and a token ring.

The routers support three software images: Basic, which is IP routing, 802.1D bridging, Data Link Switching and Simple Network Management Protocol management; Standard, which is Basic plus IPX and AppleTalk routing; and Enhanced, which is Standard plus Xerox Corp's Xerox Network Systems and Digital Equipment Corp.'s net routing.

Pricing starts at $2,295 for Colorado and $2,795 for Colorado Plus. Both will ship in March.

Compatible Systems, meanwhile, is touting the firewalling capabilities of two of its Advanced MicroRouter access routers recently announced. The 1220i and 2220R feature two Ethernet attachments and two WAN links supporting speeds from 28.8K bit/sec to T-1/E-1.

For Internet security, users can deploy the 1220i to create one public net with Internet servers while keeping all incoming traffic off the corporate networks.

The 1220i costs $1,695 and the 2220R costs $1,895. They will be available in February.

Lastly, Motorola's new Vanguard 310 line allows users to migrate from ISDN to frame relay switched virtual circuits once they become available. Four models of the 310 series come standard with one Ethernet and one ISDN BRI with an integral NT-1. All models also feature 4-to-1 data compression; IP, IPX and AppleTalk routing; and frame relay and X.25 data link support for routing frame relay and X.25 packets over ISDN lines.

Available now, the Vanguard 310 line starts at $995.

✆ ACC: (805) 685-4455; Compatible Systems: (303) 444-9532; Motorola: (508) 261-4000.

Router roundup

Company	Product(s)	Description
ACC	Colorado, Colorado Plus	Branch office router that enables consolidation of legacy and LAN traffic over frame relay and ISDN lines.
Compatible Systems	MicroRouter 1200i, 1220i, 2200R and 2220R	Internet access and multiprotocol routers for small to midsize sites needing T-1/E-1 speeds and dual-Ethernet firewall security.
Motorola	Vanguard 310	Remote access device providing ISDN connectivity to LANs and the Internet with migration to emerging frame relay switched virtual circuits.

Remote access

Continued from page 17

users more productive, they are still not out of the woods. Many are surprised to find that as much as 35% of their remote networking expenditures — an average of $1.6 million annually, according to Infonetics Research, Inc. in San Jose, Calif. — are for such things as equipment configuration and troubleshooting, user training, and misuse of equipment and services.

"The cost of that to the total value proposition raises lots of questions," said Larry Lake, vice president of telecommunications services at SmithKline Beecham Corp. in Philadelphia. "I'm not sure we're getting a huge benefit out of this because the cost is substantial."

Some companies acknowledged they didn't plan well enough.

The Stanford University Health Clinic, for example, failed to factor the cost of security into its remote access equation.

"You have both administration and ongoing upgrades" with a security system, said network architect Robert Tharp. "As fast as you get the darned thing rolled out, somebody's found a hole in it. So you're already looking at your next-generation security."

Though those upgrade costs will be recurring, the clinic is attempting to get a grip on training costs for the security system by developing a common front end to it.

That way, when the system is upgraded, administrators will not have to be trained all over again on how to use it. ■

ISDN

Continued from page 17

According to Data TeleMark President Frank Piepiorra, one application connects a land office with an offshore oil rig over a satellite link. The connection transmits data during the day and lets the crew videoconference with their families at night.

Thomas VonDeak, ISDN experiments manager for NASA's Advanced Communications Technology Satellite Center in Cleveland, said the center has tested the devices and used them to deliver videoconferencing over Intel Corp.'s ProShare product. He said the Data TeleMark product was the only one of its kind NASA could find to run its ISDN over satellite experiments.

The DICA 6400 costs about $10,000, depending on options.

George Hobday, a systems integrator with Yorkleigh Engineering Sales Co. in Finksburg, Md., said a 256K bit/sec extension including two smaller DICA 6200 boxes and radio units costs $15,600.

✆ Data TeleMark: (703) 847-5445.

WAN MONITOR

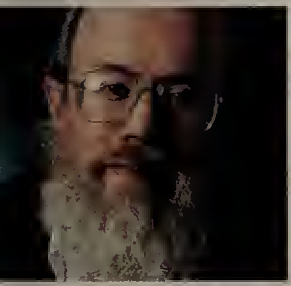
How do businesses justify URLs?

URLs are popping up everywhere. From *Network World* to *Good Housekeeping* and *TV Guide,* one now regularly sees URLs in daily newspapers, weekly newsmagazines and even on television.

They are also popping up in increasing numbers in advertisements:

Movie ads (http://www.toystory.com, http://www.mgmua.com/richard), advertisements for cars (http://www.plymouthcars.com), help wanted (average three per page in the Sunday *Boston Globe*), cable channels (http://www.cnn.com), TV stations (http://www.whdh.com), well-hyped sports events (http://www.superbowl.com) and even food (http://www.pizzahut.com).

The above set of URLs indicates quite clearly some of the problems and promise of using the Web for business. Making a business case for some of the URLs could be easy. Customer surveys could tell Disney and MGM/UA if people who visited their Web pages then went off to see the movies featured, and tell Chrysler if people trying out the "select your own options and see what the sticker shock will be" service later purchased Chrysler cars. (I tried it out and found that to get the Caravan I wanted would set me back about $22K, rather more than I paid for my first Caravan in 1984.)



Scott Bradner

Questionnaires given to prospective employees could indicate if putting a company's open job list on a Web page produced a better class of applicant. (In quite a few cases the URL dominates the ad.)

Finally, since the Santa Clara, Calif., Pizza Hut takes orders directly from its Web page, it is very easy to tell if they are getting their money's worth.

But how does a business gauge the return on a Web server that primarily gives away information? What does CNN get from visitors to its Web page, or WHDH-TV or the Super Bowl?

While the Super Bowl Web site is littered with ads, the other two aren't. Don't get me wrong, I find the CNN site very useful and don't mind getting a weather snapshot from a local TV station (even if it is a day out of date) to see if I should take an umbrella to lunch. But I don't know what they get out of providing the service that will make them keep doing it.

The other thing that became very clear during the Super Bowl was that the scaling issue had not yet been solved. Trying to reach the superbowl.com server just after one of the on-air promos was hopeless. It must have been way overloaded since it was rejecting connection attempts and, even when one got in, the data often came back as a null set. It took repeated attempts to get something real. I had the same problem with the plymouthcars.com server right after an ad giving the URL.

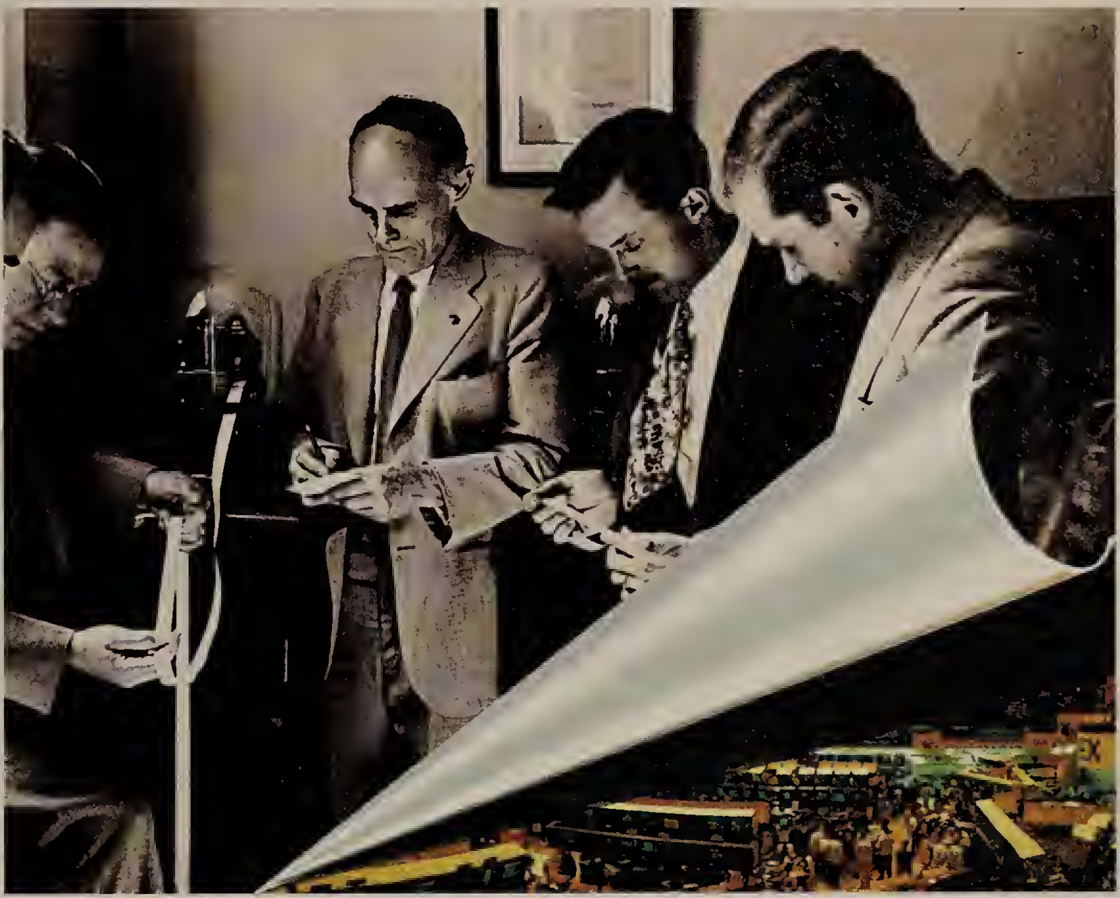
So how does a company decide just how big and well-connected a server it needs when it's not a direct retail site? Don't ask me. I don't see the rationale for much of the promotional activity some companies engage in, like trying to make me buy breakfast cereal by using actors dumber than the product in their ads.

Oh yeah, on the radio this morning, Paul Harvey told his not-known-to-be-geeks listeners that Wal-Mart was setting up a Web site so that users can buy their merchandise over the 'Net. This is getting all too mainstream for this old bit-pusher.

Disclaimer: An indication of Harvard's activity in this area is that harvard.com belongs to a Harvard Square bookstore not to the Business School, so the above are my ramblings and not Harvard's.

Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu.

Just because things are different doesn't mean everything has changed.



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TCP/IP is key to IBM's open mainframe future

By Michael Cooney
Raleigh, N.C.

Once considered a form of the black plague in IBM SNA networking circles, TCP/IP seems more like a healing salve these days.

Rather than shunning TCP/IP, IBM now deploys a wide swath of TCP/IP products across all of its hardware and software families.

This transformation has come about for a variety of reasons, not the least of which are some irrefutable facts: The Internet reaches about 3.2 million hosts, connecting more than 25,000 networks and 30 million users, according to IBM. Researchers at International Data Corp. said that by 1997, nearly 5.1 million PCs and other devices will be running TCP/IP, up from about 520,000 in 1991.

On top of that, and by IBM's own count, at least half of the Systems Network Architecture nets anchored by mainframes installed in the world have TCP/IP running alongside them. In addition, IBM Chairman Louis Gerstner considers TCP/IP products and services to be an integral part of his "network-centric" plans for IBM's future.

"We know that if we don't provide strong products for users, somebody else will," said Brad Buff, brand manager for IBM's TCP/IP products. "Our overall strategy is to add features that improve the reliability and stability of all our TCP/IP products so that users can deploy them anywhere throughout their networks."

NetworkWorld Fusion
http://www.nwfusion.com

IBM's TCP/IP strategy hinges on continued explosive growth of the Internet. See what one market research firm has to say about the 'Net on Network World Fusion. Select News+ then WANs & Internetworking.

The area that has seen and will continue to get the most attention is the mainframe environment, where IBM has been refocusing for a few years. One of the biggest changes in the MVS mainframe will occur this spring when IBM rolls out a new version of MVS, currently dubbed OS/390, with integrated TCP/IP support.

OS/390 will integrate more than 30 software products that are today sold separately. As the follow-on release of MVS, OS/390 will be built on the current release, Version 5.2.2, and integrate other software, such as VTAM, TCP/IP for MVS, OpenEdition/MVS, and System Object Model run-time and class libraries support.

"We've revamped the mainframe hardware with CMOS technology, and now it's time to redo the MVS software," said Linda Sanford, general manager of IBM's System/390 division. "Users will no longer have to deal with a piece-parts approach to building their systems."

One of the other keys to OS/390 is cost. Sanford claimed most users could expect to save at least 30% in overall mainframe system software costs and reduce installation times by as much as 50%. OS/390 also should reduce the intricacies of the mainframe world.

"The complexity of multivendor, multiplatform systems has gotten out of hand, and we're hoping IBM can simplify things a little," said Jeff Grigg, principal technical support analyst with Bath Iron Works in Bath, Maine. "We have a very large shop and a very small staff, and we're hoping the OS/390 package makes life easier."

Analysts said IBM also is trying to change the attitudes of many TCP/IP users who believe that the mainframe won't be an integral part of the TCP/IP evolution.

Buff *says IBM is building TCP/IP support across the enterprise.*

User groups are helping drive this new mind-set. In its annual survey of members, the large IBM user group Share, Inc. lists mainframe evolution and interoperability as two of its members' top five concerns.

"TCP/IP users aren't used to the kinds of features, like high availability, storage facilities and throughput capabilities that a mainframe has," said Anura Guruge, an independent analyst based in New Ipswich, N.H. "Ultimately, the strategy is that IBM wants to give mainframe TCP/IP shops the same level of availability they are used to in the SNA world."

Over the next 12 months, IBM is expected to continue evolving the multivendor TCP/IP aspects of the mainframe as well as its Unix-based OpenEdition/MVS mainframe technology. OpenEdition/MVS is Distributed Computing Environment-based software that lets users run native Unix applications on the mainframe. It is the driving product behind IBM's desire to ensure a role for the mainframe in Unix-based client/server nets.

IBM'S PLATE OVERFLOWS

Here's a sampling of IBM TCP/IP features:

Feature	MVS	OS/400	OS/2	Windows	AIX	VM	VSE
FTP	★	★	C	C	★	★	★
Telnet	★	★	C	C	★	★	★
SMTP	★	★	C	C	★	★	★
NFS	★	★	★	★	★	★	★
SNMP agent	★	Planned	★	★	★	★	★
CICS Sockets	★	C	C	C	C	C	C
RPC	★	★	★	★	★	★	★
HPNS	Planned	NA	NA	NA	NA	NA	NA
SLIP/PPP	NA	NA	★	★	NA	NA	NA
WinSock	★	★	★	★	★	★	★
Web (Internet)	Planned	Planned	★	★	Planned	Planned	★
Gopher	NA	NA	★	NA	★	Planned	★

★ =Available C = client NA = Not applicable
HPNS = High Performance Native Sockets

Coming this year is a new version of TCP/IP for MVS, which will be integrated into OS/390 and will work hand-in-hand with TCP/IP improvements IBM has slated for its other mainframe communications products. For example, IBM is working to let VTAM, its mainframe communications control package, handle TCP/IP flows to the mainframe (*NW,* Aug. 21, 1995, page 1).

Today, VTAM takes no active roll in handling TCP/IP traffic. But according to IBM, users could see at least a sixfold improvement in throughput with VTAM handling the TCP/IP activity. Other work is also ongoing to improve TCP/IP throughput via the 3745/3746-900 front-end processor family.

OpenEdition/MVS is getting a new package called the TCP/IP Version 3 OpenEdition Applications Feature, which will support a telnet server and allow users on other TCP/IP hosts to log on directly to an OpenEdition MVS host. Previously, TCP/IP users had to go through the mainframe Time Sharing Option (TSO) application, which would slow transactions and complicate communications because most Unix users were unfamiliar how to use TSO.

OpenEdition also will get a File Transfer Protocol (FTP) server capability, which will let mainframes exchange files with other TCP/IP hosts. FTP is the protocol used to transfer large files between TCP/IP hosts.

"IBM is doing a good job of preparing the mainframe for the time when TCP/IP will be used more than SNA," Guruge added.

IBM's Buff would not go that far, however. He said IBM was developing SNA and TCP/IP products at about the same levels.

"We continue to make significant investments in both technologies," he said.

As for Internet support, IBM said it is working to add Internet support across its line of products. In particular, the company plans to integrate applications such as its Lotus Notes and cc:Mail packages on top of all of its Web server and client applications so users could exchange business data over the 'Net more readily. For Internet access, IBM said it would offer Web server software on the Scalable PowerParallel SP2 system, the Application System/400 and the OS/2 by late in the year.

Customers appreciate Big Blue's efforts. "We are migrating to TCP/IP slowly, but we are doing it because it gives us more flexibility than SNA ever could," said Eric Bala, network services manager with the University of California Medical Center in San Diego. ■

CICS 'opened' to TCP/IP

Looking to open its mainframe environment up even further, IBM this week will begin offering new TCP/IP access for CICS applications.

The feature, called CICS Open Network Computing (ONC) Remote Procedure Call (RPC) will allow non-CICS applications running on Unix operating systems to access CICS data on MVS-based mainframes.

CICS is IBM's premier transaction processing (TP) monitor, and CICS applications are the underpinnings for many companies' daily business. TP monitors manage the mechanics of providing end users with reliable access to distributed data. For example, CICS synchronizes systems, network and application resources, as well as handles tasks such as user authorization, security and restarts.

The CICS ONC RPC software, which was developed by Sun Microsystems, Inc., provides an RPC interface and lets the mainframe look like a big server to downstream clients running ONC software.

ONC is supported on most Unix operating systems, OS/2, VM, OS/400, as well as VMS, Windows NT and MacOS clients.

CICS ONC RPC will be available March 1 for CICS Version 3.3 and 4.1. The mainframe must be running TCP/IP for MVS Version 2.2.1 or later. Pricing was not disclosed.

—*Michael Cooney*

Local Networks

Covering: Operating systems • LAN management
Hubs • Switches • Adapters and other equipment

Briefs

■ *Hub maker* **Transition Networks, Inc.,** *based in Minneapolis, last week announced a new 16-port* **token-ring hub** *that can be stacked as many as eight high to support 128 nodes per stack.*

The StackMaster TR eliminates network jitter, timing variations caused when data arrives in uneven intervals. In addition, the hub extends the reach of token ring to up to 300 meters with unshielded twisted-pair (UTP) cable by using digital Phase Locked Loop technology to retime each packet. Previously, UTP networks were limited to 100 meters.

The hub costs $1,599, and an optional Simple Network Management Protocol management card is priced at $795. Both are available now.

Transition: (800) 325-2725.

■ **Lite-On Communications, Inc.,** *a Milpitas, Calif.-based OEM supplier of Application Specific Integrated Circuits, will enter the networking market next week when it unveils 10M and 100M bit/sec* **PCI adapter cards.** *Among the first new products will be the LiteSpeed 100, a 32-bit bus master Ethernet PCI adapter priced at less than $100. During the first quarter, Lite-On is also expected to announce a 100M bit/sec Ethernet hub. Later on, the company plans to offer a range of Ethernet and fast Ethernet adapters, hubs and switching hubs.*

Lite-On: (800) 785-4831.

■ **Digital Equipment Corp.** *of Maynard, Mass., last week announced a* **10M/100M bit/sec Ethernet PCI controller,** *the first dual-speed chip designed for motherboards. The 21142 chip will allow vendors to offer Ethernet connectivity for mobile and desktop systems with an upgrade path to 100M bit/sec fast Ethernet when needed.*

With device drivers to support most major PC operating systems, the chip can be used for portable and PCI-based PCs, as well as servers, routers and switching products. The chip costs $22 for 5,000 units. Shipments will begin in March.

Digital: (508) 568-4000.

Madge Networks buys its way into wide area

By Jodi Cohen
San Jose, Calif.

LAN switching provider Madge Networks, Inc. last week extended its reach into the wide area with the $165 million acquisition of multiplexer vendor Teleos Communications, Inc.

The deal gives Madge WAN access switching products and ISDN technology, which the firm will add to its Ethernet, token-ring and Asynchronous Transfer Mode switching product portfolio. The buyout will provide customers with integrated switching technology across the LAN and WAN to support a mix of voice, data and multimedia applications, analysts said.

Teleos' flagship product is the WAN AccessSwitch, which attaches to a hub or router and multiplexes traffic over leased lines.

Madge's move into the wide area makes a lot of sense, according to Tom Bain, a research analyst at META Group, Inc., a consultancy in Reston, Va.

''Madge is realizing that the climate of the market is changing,'' he said. ''Users are interested in vendors that can provide more networking pieces that make up a compelling systems approach.''

Bain expects more LAN switch vendors, such as 3Com Corp., Bay Networks, Inc. and Cisco Systems, Inc., to acquire WAN access products, as well.

Melissa Morales, an analyst at Datapro Information Services Group in Delran, N.J., said the Madge/Teleos deal is a good example of how LANs and WANs are converging. ''Madge is offering its LAN customers access to the WAN without dragging ISDN lines to users' desktops, which can be expensive,'' she said.

Madge focused exclusively on the token-ring market until last year when the company acquired LANNET Data Communications, Ltd. for its Ethernet switches. Madge also developed its own line of 25M bit/sec ATM switches.

But it was missing important remote LAN access technology until making the Teleos buy.

''This deal is probably most important in the remote access setting, where nine times out of 10, users will choose their existing LAN vendor for the remote office equipment,'' Bain said.

The merger is expected to be completed by the companies this quarter. Teleos, which has about 150 employees, will operate as Madge's WAN Access Product Division, with Michael Caglarcan leading the unit as vice president and general manager. Rod Randall, Teleos chief technology officer, will become vice president of WAN Access Technology.

Cisco connection

Separately, Madge said that it will license Teleos' ISDN switching technology to Cisco, which will use the technology in its universal access server. The companies will jointly develop the server to address the carrier and Internet service provider markets.

Also, Madge will license Cisco's Internetwork Operating System routing software for integration into a future edition of the WAN AccessSwitch. ■

What they bring to the table

Company	Founded	Primary products	1995 revenue
Madge Networks	1986	Ethernet, token-ring and ATM switches	$402 million
Teleos Communications	1987	WAN access switches	$24 million

Microsoft adds SNMP support to its management software

By Kevin Fogarty
Redmond, Wash.

Microsoft Corp. has introduced a new version of its Systems Management Server (SMS) that includes support for the Simple Network Management Protocol and the ability to remotely control Windows NT Workstations and Servers.

Version 1.2 will include a conversion utility that can change a Windows NT event into an SNMP trap and send the trap to any SNMP-compatible management platform, said Phil Holden, Microsoft's product manager for SMS.

The new version also can be used to remotely control any machine running NT Workstation or NT Server and perform any operation as if the net manager was working on the remote machine locally. Remote connections can be made across links supporting TCP/IP, IPX, X.25 and ISDN. Previous versions could remotely control DOS and Windows machines but not those running NT.

While the addition of even some SNMP support is a real step forward for Microsoft with SMS, the level of that support is still fairly shallow, said Claire Price, an analyst at Gartner Group, Inc. in Stamford, Conn.

''SNMP support will make customers who are leaning toward SMS happier, but really, it's pretty basic,'' she said. ''This is stuff they should have done in the first release. That they couldn't do remote control on NT was a real hole.''

"This is stuff they should have done in the first release," said Claire Price.

Microsoft needs to add greater SNMP support, such as the ability to discover and manage routers, as well as new features such as software metering, she said.

The company is looking to support other protocols in addition to SNMP, including the Desktop Management Task Force's Desktop Management Interface, Holden said.

SMS 1.2 goes into beta testing in the second quarter. ■

Microsoft offer combines Win95 and NT license

By Kevin Fogarty
Seattle

In a move designed to let users eyeing Windows NT Workstation jump to Windows 95 first, Microsoft Corp. has launched a program offering licenses for both under one umbrella.

Microsoft has announced the Windows 32-bit Family Maintenance plan under which customers with 25 or more PCs can upgrade from Windows 3.X or Windows for Workgroups to Windows 95 or Windows NT Workstation for the same price.

The plan is open to customers already enrolled in the Open or Select volume discount programs.

NetworkWorld Fusion

Need to track your software licenses? Get info on software metering at http://www.nwfusion.com. Select News+ then Local Networks.

Under the program, Microsoft customers buy a per-user license and get the right to distribute Windows 95 and Windows NT Workstation in whatever mix they prefer.

The program also lets customers change the mix, which would allow Win95 end users to switch to NT Workstation without additional cost. For example, an engineering firm with 25 PCs could put 10 engineers on NT Workstation and 15 other staffers on Windows 95.

''That's pretty neat, but I'd want to see how the costs compare [to current upgrade costs],'' said Robert Brydia, research assistant at the Pennsylvania Transportation Institute at Pennsylvania State University.

The retail price of the Family Maintenance plan is $229 per PC, although the street price will undoubtedly be lower, according to Troy Oldham, product marketing manager for Micro-

See **Microsoft,** *page 22*

Microsoft

Continued from page 21

soft's organizational licensing division.

The program is intended to give customers that know they will eventually migrate to NT Workstation an upgrade path, Oldham said.

Currently, it costs $185 to upgrade to NT Workstation from Windows 3.X, plus $130 for a two-year maintenance program that includes all revisions, Oldham said.

Customers that only want to upgrade to Windows 95 should buy the $130 Windows Maintenance program, which guarantees them all revisions and service packs for two years.

Brydia, who is converting a 105-user, one-server Banyan Systems, Inc. VINES network to a two-server Windows NT Server net, is evaluating Windows 95 clients for the NT network.

"I might put power users on [NT Workstation], but Win95 has the ability to do PPP dial-in to [NT's Remote Access Server] and some better features for laptops for faculty on the road," Brydia said.■

Microsoft Family Maintenance upgrade plan

Upgrade	Price per desktop	What you get
Windows 3.X to Windows 95	$130	Windows 95, plus all upgrades for two years
32-Bit Family Maintenance plan	$229	Either Windows 95 or NT Workstation, plus all upgrades for two years
Windows 3.X to NT Workstation	$315	NT Workstation, plus all upgrades for two years

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WIRED WINDOWS

Plugging those Windows 95 security leaks

Network security is a perennial hot topic around the IS watercooler. Whenever a new network or desktop operating system is released, we all want to know about its security implications.

But what we really want to know is how much harder or easier it makes our jobs as the guardians of the corporate data mine.

Dave Kearns

I've mentioned more than once in this column that Microsoft Corp.'s Windows 95 makes it easier to control the look and feel of the user's desktop remotely.

Many of the things that used to require a visit to the end user's cubicle to adjust or fix now can be done with a combination of system policies and remote registry manipulation.

But one thing I have not said, nor will I ever say, is that Windows 95 increases the security of the desktop.

The logon box that pops up when you boot Windows 95 could very easily give you a false sense of security. Try this on a system where the logon box comes up in a Windows — rather than a network — logon screen: Instead of entering your password, click the Cancel button. Now try to figure out what difference that made. Unless you've spent considerable time configuring separate desktops for yourself and the "default" user, you won't see any difference.

Worse, if the system boots up with a network logon, Windows 95's built-in password caching could automatically log on the end user under a different name.

TIP OF THE WEEK

There's a lot that can be done with the Windows 95 Registry, but it's not very well documented by Microsoft. Kent Bentkowski has put together an excellent document addressing frequently asked questions about the Registry.

Randy Burgess has compiled the document into Windows Help format. It's available at http://www.cris.com/ randybrg/win95.html on the Web.

There have been numerous stories about the inherent insecurity of file and print services in Windows 95, as well as about the weakness of Microsoft's encryption algorithm for Windows 95, Windows for Workgroups and Windows NT. The encryption issue was recently addressed by Microsoft (see http://www.microsoft.com/ for information and updates).

Some network administrators have deluded themselves into believing that they can disable editing of the Windows 95 Registry at the workstation using a combination of remote registry editing and system policies to secure desktops. But all the semiknowledgeable end user needs to do is boot in "safe mode" and hack away at the Registry. Safe mode is a good thing — it allows us to recover from what would have been fatal errors requiring a full reinstall in earlier Microsoft operating systems — but it totally subverts any software-based desktop security system.

All of this should remind us of the first tenet of security: System security begins with physical security. If the unauthorized or potentially troublesome end user has physical access to the system, then there is no way — using software alone — to protect that system from misuse.

Windows 95 is a major improvement over the combination of DOS and Windows 3.X as a network client operating system. It increases the efficiency of network managers by allowing much more to be done automatically and remotely. It is not, however, secure in any real way. Worse, it can give the unwary network manager a false sense of security.

Follow links on Network World Fusion for security-related Windows 95 Web sites. From the main menu, select Forum then Wired Windows.

http://www.nwfusion.com

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at dkearns@msn.com.

NET RESULTS

What's in an ATM switch?

Ask us to list all the essential elements of an ATM switch.

OK, we will: a cell-based switching fabric; multigigabit capacity; signaling software; Ethernet switching; LAN emulation; fast Ethernet support; UNI 3.1; Segmentation and Reassembly functionality...

Skip Macaskill and Melinda Le Baron

"Huh?" you ask. "Ethernet switching? Support for fast Ethernet?"

Unfortunately, yes. There is a disturbing trend in the industry to grow an Asynchronous Transfer Mode switch down into the LAN, stocking it with modules that deliver Ethernet, fast Ethernet and even token-ring switching.

By introducing this functionality into an ATM switch, vendors are generating a great deal of confusion in the user community because they are suddenly repositioning their once-pure ATM switches as network border devices, LAN switches, hubs-of-hubs or switches-of-switches.

The problem is that many of these vendors already have established product lines in place to handle those LAN-based capabilities. But now they're telling users that they can employ an ATM switch to accomplish the same goal — at a far greater premium, of course.

They are attempting — lamely — to explain the difference in positioning between an ATM switch that can now do Ethernet switching and a high-end LAN switching hub that can be outfitted with an ATM switching module.

Case in point: 3Com Corp. As reported in these pages last week, 3Com will integrate both fast Ethernet and Ethernet switching modules into its Cellplex ATM switch. It also will provide a variety of ATM switching modules — based on IBM technology — for its top-shelf ONcore switching hub. And it will even integrate some of this functionality into its high-end LANplex 6000 LAN switch. So what's the difference between Cellplex, ONcore and LANplex? Despite 3Com's best arguments to the contrary, those lines of distinction are quite blurry when you look at certain configurations.

But this is not just about 3Com. Other vendors are contemplating the same type of integration for their ATM switches, so users should expect more examples of the infamous "positioning shuffle" in the near future.

This trend also points to another undeniable fact: The pure ATM switches simply aren't selling like the hotcakes vendors figured they would be. Giving the ATM switches more far-reaching and practical LAN functionality is a blatant attempt to make them more attractive.

Think about it. If you need a car, you don't go out and buy a whole dealership. If you need an Ethernet switch, buy a LAN switch rather than an ATM switch.

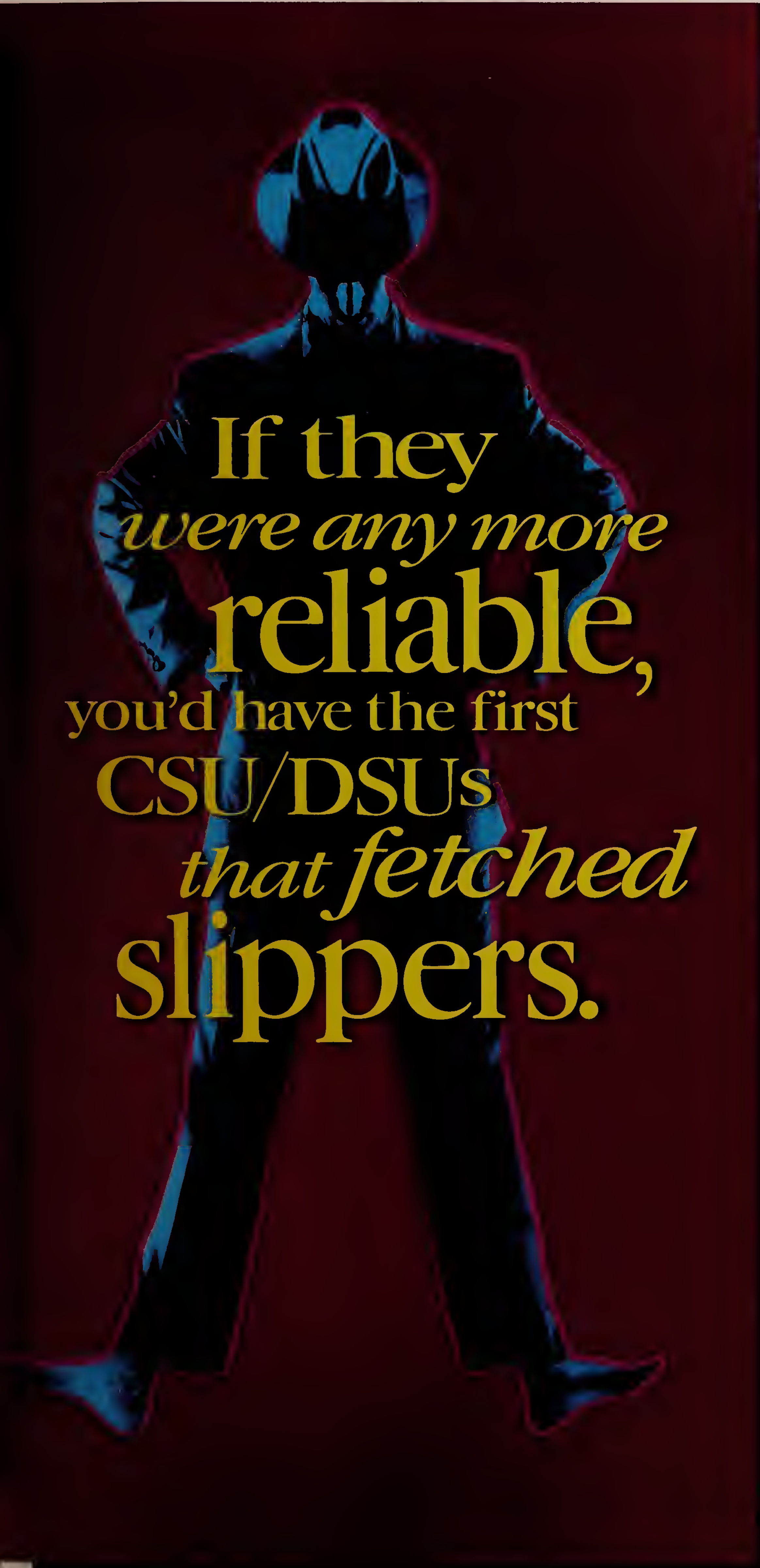
It's a Madge, Madge world

A couple of things struck us about the Madge Networks, Inc. announcement last week that it plans to buy Teleos Communications, Inc.

First, we wondered why Madge went out of its way to say it would leave the huge data-driven market to competitors while focusing on multimedia networks combining data, voice and video? Seems kind of shortsighted.

Also, why did Madge go out of its way to announce it would not compete in the Internet service provider market, instead licensing some key ISDN technology to Cisco Systems, Inc. so Cisco can romp in that market? Seems a heavy price for Madge to pay in order to get its hands on Cisco's routing software.

Le Baron is a research director and MacAskill a senior research analyst in Gartner Group, Inc.'s Network Computing Infrastructure group. They can be reached by E-mail at inquiry@gartner.com or by phone at (203) 316-1111.



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AT&T Paradyne

Client/Server Applications

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Briefs

Atria Software, Inc. *last eek announced ClearCase 2.1 for indows NT, the latest version of s* **software configuration anagement** *product, now med at midsize and large Win- ws NT application development oups. The new version is inte- ated, via Microsoft Corp.'s Com- on Source Code Control terface, with Microsoft's Visual sic and Visual C++ tool sets.*

Atria also released ClearCase tache 2.0, a PC-based client pro- am running on all Windows cli- ts. ClearCase 2.0 for NT costs 000 for the first floating user ense, while Attache costs $995. th will be available by April.

Atria: (617) 676-2400.

Object request broker (ORB) pplier **Iona Technologies, d.** *of Dublin, Ireland, last week d it will integrate its product, ich is based on the Common B Architecture (CORBA), with* **Java** *development language m Sun Microsystems, Inc. By nding the products, Iona said, elopers can build download- e applications for accessing ltiple back-end services via the ernet. A limited release is set June.*

Iona: (800) 672-4948.

ampbell Services, Inc. *released OnTime Enterprise a new edition of its enterprise* **up scheduling** *program. ion 3.0 adds support for Win- s 95 and adopts many of the dows 95 graphical user inter- features. A native Windows 95 it version is due by April. ampbell: (810) 559-5955.*

he Enterprise Data Access)/SQL middleware product **Information Builders, (IBI)** *will support* **Lotus elopment Corp.'s** *Notes- p 1.0, a move that will let s users access legacy data in ional and nonrelational bases. NotesPump is server- d software that lets Notes and databases. No shipment date announced.*

1: (212) 736-4433.

Gupta gives large-scale applications a shot

By Barb Cole
Menlo Park, Calif.

Gupta Corp. has announced its next-generation application development tool suite — an offering the troubled software company hopes will be its savior.

Gupta's new Centura suite is for building large distributed applications that can run across the World-Wide Web as well as corporate networks. The tool is a departure from the departmental and rapid application releases traditionally offered by Gupta, soon-to-be renamed Centura Software Corp. as part of a corporate restructuring. The client/server software company recently announced more poor financial results, workforce reductions and the impending departure of founder Umang Gupta (*NW,* Jan. 8, page 10).

The new Windows-based Centura suite is designed for building applications from interworking software components that can be split among clients, application servers and database servers. This three-tiered approach is designed to support thousands of users. That kind of scalability is unlikely with tools such as Microsoft Corp. Visual Basic, Borland International, Inc. Delphi and Gupta's own SQLWindows, which simply divide work between clients and servers.

The Centura suite consists of four products:

- Team Developer is the development environment.
- Application Server is a collection of application partitioning facilities.
- Ranger handles data replication between Gupta's SQLBase database server and a host of other relational databases.
- Web Data Publisher, which can reside outside the corporate firewall, is middleware for linking Web browsers to databases. (Also on the Web front, Gupta will embed Javasoft's Java interpreter in the Centura development environment, enabling developers to build Java applets.)

While learning to build three-tier applications typically might be difficult for programmers accustomed to creating two-tier client/server applications, the fact that Centura is compatible with Gupta's existing SQLWindows tool should help, said Matt Miller, vice president of product

See **Gupta,** *page 24*

Deal of the Centura

Product	Price	Availability
Team Developer	$4,995	Q1
Ranger	$495	Q1
Web Data Publisher	To be announced	Q2
Application Server	To be announced	Q3

PowerBuilder to get Web hooks

By Barb Cole
Concord, Mass.

Sybase, Inc.'s strategy for supporting Internet applications has become a bit clearer now that its Powersoft subsidiary has announced plans to enable Web-based application development with its PowerBuilder tools.

By midyear, developers will be able to add browser functionality to existing PowerBuilder applications or plug PowerBuilder components into browser-based Internet applications.

The announcement is part of a broader Sybase initiative called web.works, which also includes Sybase's recently announced web.sql middleware for linking databases to HTML pages. Additional database and middleware products that tie into the Internet are planned for release in the next six months, the company said.

At the core of Powersoft's plan is a version of PowerBuilder's DataWindow component that is compliant with browsers from Microsoft Corp. and Netscape Communications Corp. The free, Web-enabled DataWindow will help developers overcome HTML's limited data-handling capabilities by presenting data in several formats, including rich text, grid and graphics.

In addition, the DataWindow handles client access to multiple databases without requiring low-level coding, according to Keith Daniel, vice president and general manager of Internet products at Powersoft.

An announcement of support for Java within PowerBuilder is expected this week, and the addition of a multimedia authoring component for managing audio and video within PowerBuilder is slated for the end of February.

Although Sybase is still evolving its Internet strategy, analysts said the Powersoft announcement is a good sign of the company's intent to play in this space.

"They've put together a good story for dealing with their existing PowerBuilder users, but they need to go beyond just addressing [those] developers," said Stan Dolberg, an analyst at Forrester Research, Inc. in Cambridge, Mass.

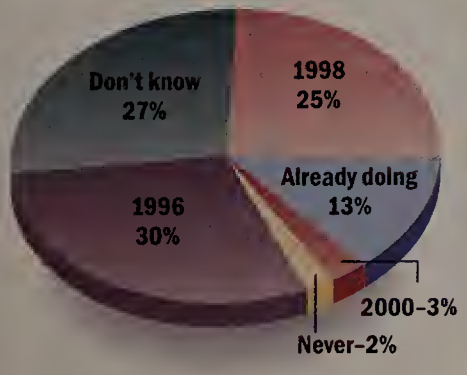
Users said the Sybase plan is sound because it allows for the addition of Web capabilities into existing PowerBuilder applications. "Our first thought was to put up a Web site and build new applications [to distribute information about our products], but that capability can now be integrated into existing applications," said Vince Dobilas, project leader of client/server development at American Standard Companies, Inc. in Piscataway, N.J., which has adopted PowerBuilder as a development tool.

©Sybase: (510) 922-3500.

Powersoft eyes ripe market

When will your company conduct business transactions over the Internet?

Based on a survey of 216 IS professionals.



SOURCE: FORRESTER RESEARCH, CAMBRIDGE, MASS.

http://www.nwfusion.com ONLINE

There's more available on Network World Fusion, including:

- Articles on other vendors' efforts to tie the Web to existing apps
- A look at Powersoft's next-generation client/server tool kit
- Links to PowerBuilder tips

Select News+ then Client/Server Applications.

Video products get a look at ComNet '96

By Carol Sliwa
Washington, D.C.

Several vendors last week at ComNet '96 unveiled new and improved products for group and desktop videoconferencing.

Sony Corp. introduced TriniCom 5000 group videoconferencing system, the first of several video products the company plans to roll out this year.

The TriniCom 5000, which replaces Sony's PCS 2000, includes built-in multipoint control to permit four Sony H.320-compliant systems to be tied into a single video conference, as well as a Quartet feature that can split the screen into four quadrants with a live shot in each. The system also features voice-activated switching capability and a built-in inverse multiplexer.

The TriniCom 5000 is priced at $21,500 for a single-monitor system and $24,700 for a dual-monitor setup. The self-contained, roll-about unit includes a

See **Videoconferencing,** *page 25*

Tools give MIS a grip on testing, managing distributed applications

By John Cox

New tools from two vendors are intended to help MIS groups cope with the complexities of testing distributed applications and managing them once they are deployed.

Compuware, Inc.'s new software is designed to systematically manage problems that arise after applications are up and running. Mercury Interactive, Inc. has announced new versions — and new packaging — of its Windows-based, automated software testing products.

Compuware's Fault-Xpert is a set of programs that together detect problems as they begin to form in desktop client/server applications. The software collects information about the application fault at the client workstation, such as an access violation or an application deadlock. Then the software notifies both the end user and the designated support staff.

Finally, it passes the information over the network to collection and graphical analysis applications used by the support staff.

"Until today, there's been no easy way in a distributed environment to get your hands on data about applications that fail," said Bern Trompeter, general manager of the fault diagnosis product line at Compuware, based in Farmington Hills, Mich.

Fault-Xpert is based on methodologies and concepts created for Compuware's mainframe fault management product, Abend-Aid. Data on application faults can be passed, via Compuware interfaces, to industry standard systems management products such as IBM's NetView and Hewlett-Packard Co.'s OpenView, as well as Compuware's own EcoTools.

Fault-Xpert is available now for OS/2. A version for AIX and HP-UX will be available in April, and a Windows 95 and NT version is scheduled to ship in September. The complete program set is priced at $2,000; additional client agents cost $165.

Mercury rising

Separately, Sunnyvale, Calif.-based Mercury announced TestSuite 4.0, a bundling of new versions of its software testing products. The improvements are mainly focused on helping testers create, manage, execute and analyze software testing cycles much faster than before.

WinRunner 4.0, the tool that generates test scripts for exercising all the objects on a graphical client/server display, now includes the new RapidTest Script Wizard, which helps software testers quickly set up and run test scripts on Windows applications.

The new reporting tool lets users quickly see and move through the test results. Winrunner 4.0 also has automatic exception handling — it can mark an interruption in the test cycle, caused by a condition such as not enough memory, and continue testing the application. Before this, testers had to write code to handle the interruptions.

WinRunner also has new visual tools to make it easier to set up and run tests, and to report on the results. TestDirector 2.0 now has the RapidTest Plan Wizard for guiding testers through creating and managing a full application test plan.

TestSuite 4.0, scheduled to ship in March, is in a second round of beta testing at about 50 sites. Pricing starts at $3,495 per user.

© Compuware: (810) 737-7300; Mercury: (408) 523-9900.

Gupta

Continued from page 23

management and planning at Gupta.

The company has included "wizards" that walk developers through the process of linking an application to a transaction processing monitor, which handles the partitioning of components. Centura applications may be partitioned using Novell, Inc. Tuxedo and Open Software Foundation, Inc. Distributed Computing Environment.

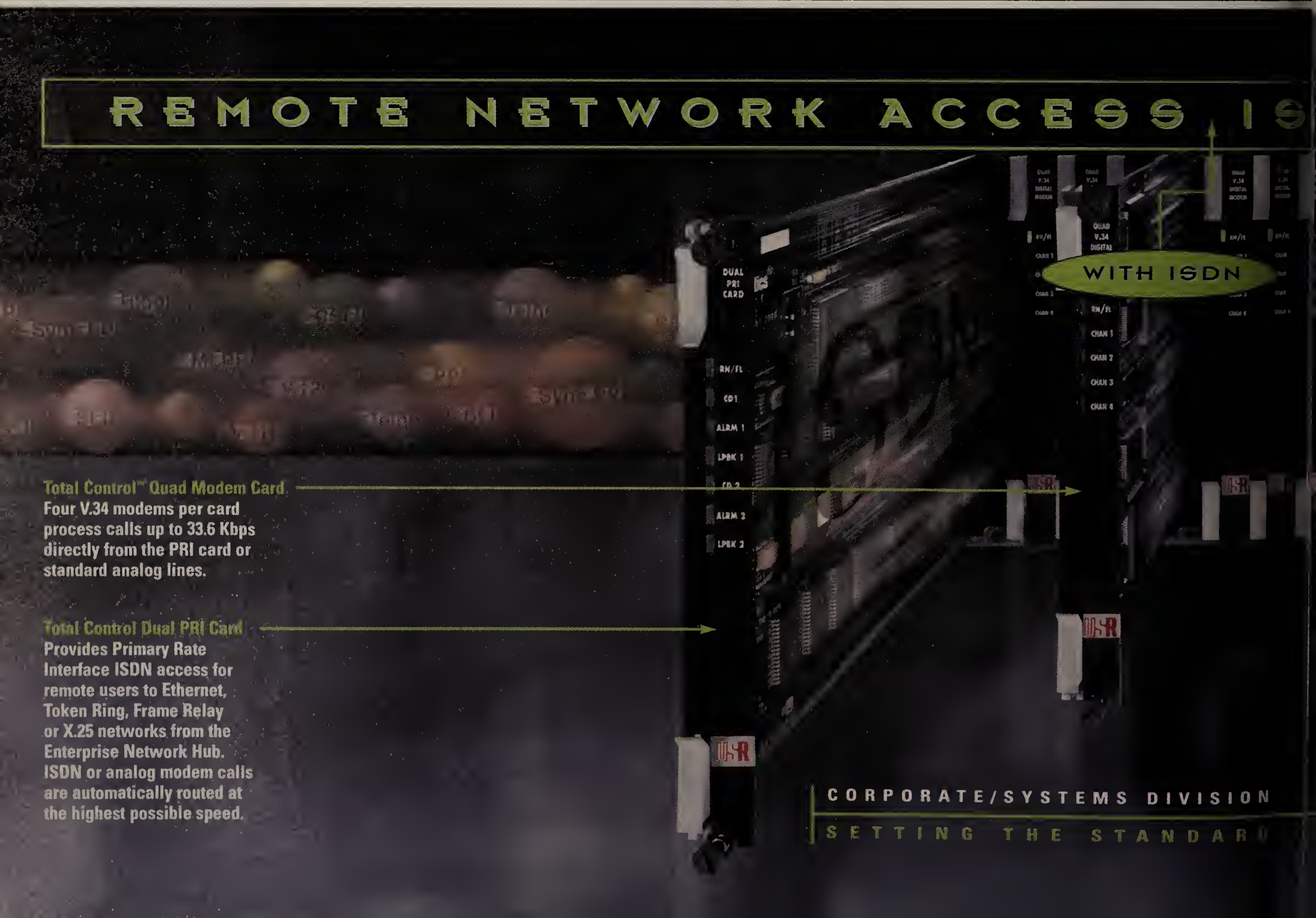
Analysts were favorable toward Centura. "Centura is considerably more robust than SQLWindows," said John Rymer, vice president of GIGA Information Group, a market research firm in Cambridge, Mass.

SQLWindows users said Centura would be key in moving corporate applications to the Internet.

"We will be able to put a lot more useful information on the Web [with Centura]," said Jim Hutton, assistant business systems supervisor at Ontario Hydro's Darlington Nuclear Generating Station, which has adopted SQLWindows as a standard and plans to move to Centura.

The utility will build an application to publish on the Web radiological emission information that by law must be made public.

© Gupta: (415) 321-9500.



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SETTING THE STANDAR

SHARED LOGIC

Do I detect a SoftSwitch resurgence?

At Lotus Development Corp.'s annual Lotusphere customer conference in Orlando, I was somewhat surprised by the number of SoftSwitch faithful that showed up. Ever since its mid-1993 acquisition by Lotus, SoftSwitch seemed to be slowly dying on the vine.

In terms of missteps, Lotus/SoftSwitch made many. First, and probably the most costly, was the emergence of Mike Zisman as the heir apparent at Lotus. He had so much to fix in Cambridge that SoftSwitch was left on autopilot without much direction.

Next, the initial version of the company's Enterprise Mail Exchange (EMX) messaging switch — stupidly renamed the Lotus Message Switch (LMS) — didn't work too well. Lastly, Lotus moved to lose all vestiges of SoftSwitch's value proposition by positioning LMS as simply a gateway to legacy mail systems. Of course, the Swiss army knife Release 4.0 CommServer could get you from cc:Mail to Notes to Simple Mail Transfer Protocol to X.400, all in one box. Most users realized then that they really didn't need LMS.

Mike Rothman

But SoftSwitch users need not fret. It looks like IBM/Lotus is going to make another run at reviving the former brand name of message backbones. They've appointed a new general manager in SoftSwitch veteran Steve Layne, who is wrapping up a stint evangelizing the Notes Public Network around the world.

Steve definitely has his work cut out for him. Frankly, the survival of SoftSwitch counts on his leadership over the next six to eight months. So, in my humble opinion, the following things need to be addressed:

■ Customer service — No question the biggest problem and most surprising considering SoftSwitch's heritage. LMS needs much better support in the field.

■ Product — The new software version of the LMS, dubbed 2.0, must work and must scale to enterprise proportions.

■ Integration — SoftSwitch must move to more of a Control Data model, leading with integration services.

■ Reposition — LMS must be given a new identity. This crap of gateway to legacy systems must stop. There is still a need in the short term — mostly abroad — for high-fidelity, highly scalable mail exchange for both SMTP/MIME and X.400.

■ Channel — SoftSwitch must better utilize its Lotus and IBM brethren. Moving to a more indirect model can take advantage of the mindshare and installed base of the biggest computer company in the world.

■ Branding — SoftSwitch used to be the brand name for mail switches and backbones. Revive the name, and quickly.

Will they make it? If I was a betting man, I'd say yes. LMS 2.0 looked good in the lab, and the new management team knows about the problems and is working to address them.

So SoftSwitchers, clearly you have quite a busy year ahead of you. But welcome back; it hasn't been the same without, y'all.

Rothman is a vice president in META Group Inc.'s Global Networking Strategies service in Reston, Va. E-mail him at MikeR@metagroup.com or call (703) 860-6600.

Videoconferencing

Continued from page 23

cart, a 27-inch color monitor, a camera, a wireless remote control and an H.320-compliant coder/decoder.

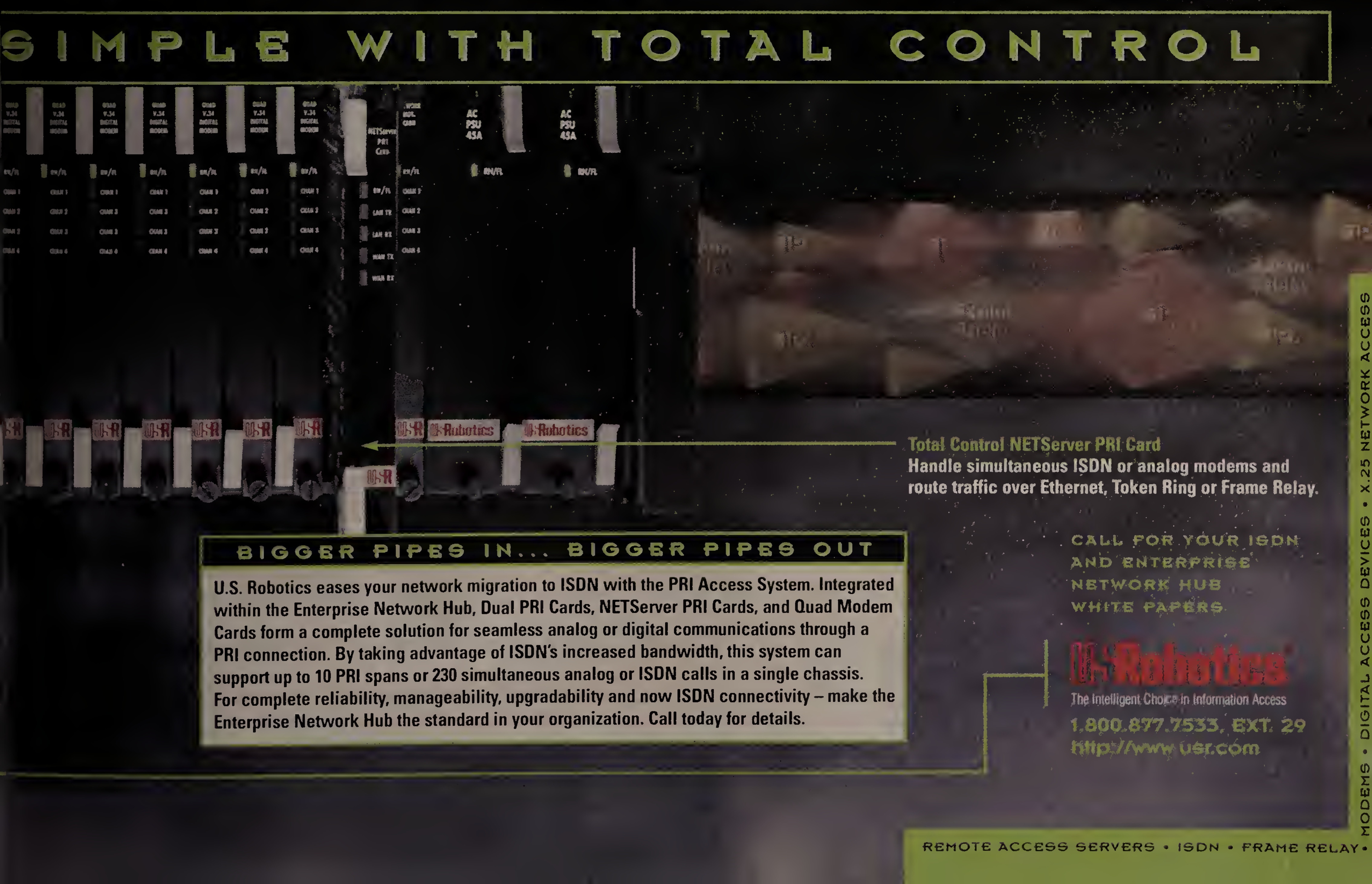
Also at the show:

■ Compression Labs, Inc. (CLI) announced its H.320-based Desktop Video 1000 system, which supports WAN links from 56K to 128K bit/sec and handles up to 15 frame/sec, and the higher performance Desktop Video 2000, which supports 56K to 384K bit/sec links and handles up to 22 frame/sec.

Each package includes a codec/ISDN board, digital video camera, telephone handset and software. CLI's products run on Windows PCs powered by Pentium processors. They comply with the G.711 and G.728 audio standards, and will work with other vendors' H.320-compliant group and desktop systems. The Video 1000 sells for $1,495, and the Video 2000 lists at $1,995.

■ Version 1.01 of Incite, Inc.'s Conversational Media system features private branch exchange integration, 15-party videoconferencing and support for communicating over the Internet. The Dallas-based company has priced the new version at $2,700 per seat.

© Sony: (800) 472-7669; CLI: (408) 435-3000; Incite: (800) 946-2483.



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NETWORKS THAT GO THE DISTANCE

Web products dominate new product shipments

By Ben Heskett

With all of the hype surrounding the Internet, it should come as no surprise that Web-related products dominate the slew of network products scheduled to arrive this quarter.

Topping the list of products researched for this quarterly shipment chart are Microsoft Corp.'s first major Internet offerings.

The company expects to ship this quarter its Internet Information Server, previously known as Gibraltar, and a firewall for the server code-named Catapult. Microsoft has already begun shipping a Windows 95 version of its Internet Explorer Web browser and has several other versions due this quarter.

Microsoft may have been late to the Internet party, but that will not matter to 80% of the IS shops looking for simple, workable Internet solutions, said Tim Sloane, director of messaging at Aberdeen Group, Inc., a Boston-based consultancy. "If you look at it from the perspective of where customers are in their acquisition process, [Microsoft] is probably in a position to put together the story and the products and deliver them in a time frame that will meet the needs of many IS organizations," Sloane said.

Messaging mess

Meanwhile, the pressure is on Microsoft to deliver in the electronic messaging/groupware arena now that Lotus Development Corp. has shipped its long-awaited Notes 4.0 product.

The Lotus software, which Notes creator Ray Ozzie described as shipping on "Dec. 32," is more scalable than the previous edition, boasts direct Internet access and includes other new features.

Microsoft's much-anticipated Exchange Server was originally due at beta sites at the end of 1994, with an expected shipment date in the first half of 1995. The server software is now expected to ship this quarter following extensive testing. Microsoft began delivering the client component of Exchange when Windows 95 became available last year.

Notes 4.0 has also put the squeeze on Novell, Inc., the other company expected to be a major factor in the messaging/groupware battle.

Novell has put off the release of GroupWise XTD until the second quarter to be safe, with officials saying only that beta testing has taken longer than expected. ■

Ready to Roll?

THE ROLL CALL

A sampling of recent network product announcements and shipments.

	Product	Company	Product description	Announcement	Original delivery plan	Status
	HARDWARE					
	ATM uplink modules	3Com	155M bit/sec ATM links for the LANplex2000 and 6000 switches	Dec. 1995	April 1996	On track
	ATM switch module	3Com	LAN-to-ATM switching for the LinkBuilder Multi-Services hub	Dec. 1995	Spring 1996	On track
●	Symmetric Digital Subscriber Line chips	AT&T Paradyne	Technology providing T-1 capacity over a standard voice phone line	Sept. 1995	Dec. 1995	Feb. 1996
●	10/100 switch modules for System 5000	Bay Networks	Ethernet and fast Ethernet switching modules	First half 1995	Second half 1995	Q1 1996
	ProLiant Pentium Pro-based servers	Compaq	Servers based on Intel's most powerful chip	Oct. 1995	First half 1996	On track
	MuxMaster 9729	IBM	Wave division multiplexer	Dec. 1995	Jan. 1996	Shipping
	SOFTWARE					
	IBM Internet Connection for Windows	IBM	Windows 95 Web browser	Dec. 1995	Jan. 1996	Shipping
	SystemView for MVS	IBM	Systems management software	Oct. 1995	Dec. 1995	Shipping
●	Informix Online Workgroup Server for Windows NT	Informix	Workgroup relational database	Q3 1995	Q4 1995	Q1 1996
	Orbix 2.0	Iona	Object request broker	Nov. 1995	Dec. 1995	Shipping
	Notes Release 4	Lotus	Groupware and groupware development	Jan. 1995	Mid-1995	Shipping
●	Saber LAN Workstation 6.0	McAfee	LAN management suite	Oct. 1995	Jan. 1996	Q2 1996
●	Exchange Server	Microsoft	A client/server, Windows NT-based update to Microsoft Mail	June 1994	Beta due year-end 1994	Q1 1996
	Windows NT Shell Update Release	Microsoft	Windows 95 GUI for Windows NT	June 1995	Q1 1996	On track
	SNA Server Service Pack	Microsoft	Distributed Gateway Service	Q1 1996	Q1 1996	On track
	Catapult (code name)	Microsoft	Firewall for Microsoft Internet Information Server	Sept. 1995	Q1 1996	On track
	Microsoft Internet Explorer 2.0	Microsoft	Web browser	Sept. and Dec. 1995	Q1 1996	Win95 version shipping; Windows 3.1, Mac and NT versions on track
	Entrust 2.0	Northern Telecom	Public-key certificates	Q1 1996	Q2 1996	On track
●	GroupWise XTD	Novell	Advanced messaging and groupware	Sept. 1995	Q4 1995	Q2 1996
	NetWare 4.2 (Green River)	Novell	Network operating system	Sept. 1994	First half 1996	On track
	Application Broker	Open Horizon	Bridges client/server tools to legacy applications	Dec. 1995	April 1996	On track
	Oracle Enterprise Manager	Oracle	Database and replication management software	Q2 1995	Q1 1996	On track
	VisualWave	ParcPlace/Digitalk	Tool set links Web to back-end applications	Nov. 1995	Dec. 1995	Shipping
	Templar 2.0	Premenos	EDI for the Internet	Q2 1996	Q2 1996	On track
	ShivaIntegrator 100 and 500	Shiva	ISDN remote access systems	Sept. 1995	Q4 1995	Shipping
●	Sybase IQ	Sybase	Database add-on to speed up queries	Q4 1994	Summer 1995	Q1 1996
	System 11	Sybase	Relational database management system	Oct. 1995	Q3 1995	Shipping
	SERVICES					
●	Multimedia Communications Exchange	AT&T	Server link to PBX for providing real-time multimedia conferencing	Nov. 1995	Q1 1996	Q2 1996
	Virtual Gateway Service	AT&T	Access to AT&T InterSpan frame relay network via carrier's Software-Defined Network and other virtual networks	Nov. 1995	Unspecified	July 1996
	Global Managed Private Line	Cable & Wireless	Dedicated circuits to multiple countries with managed multiplexers	Sept. 1995	Sept. 1995	Available
	networkMCI	MCI	Allows multiple conferenced sites to collaborate on documents in real time	Oct. 1995	Jan. 1996	Available
	Interact	US WEST	Internet service package	Oct. 1995	Q2 1996	On track

● **Missed original ship date**

Electronic Commerce

Covering: Tools and Techniques for Interenterprise Networking and Doing Business On-Line

Briefs

■ *At its annual conference, the National Computer Security Association warned companies that* **computer viruses** *are becoming common on File Transfer Protocol, World-Wide Web and Usenet sites, with particular underground groups known to be posting them at sex sites so corporate computers will become infected if their employees* **download erotica.**

■ **Bay Networks, Inc.** *routers, communications servers and hubs now work with Security Dynamics, Inc.'s ACE/Server technology so users can gain* **authentication** *access using the SecurID dynamic password tokens.*

Security Dynamics: (617) 547-7820.

■ **Internet Profiles Corp. (I/PRO) and net.genesis** *have teamed to create a software tool for* **Web site usage measurement.** *The product, called I/ANALYSIS, will ship by the end of the first quarter.*

I/PRO: (415) 975-5800; net.genesis: (617) 577-9800.

■ **Harris Computer Systems Corp.** *released a new version of its CyberGuard* **firewall,** *which now includes support for World-Wide Web services and SOCKS-compliant network applications.*

Harris: (954) 977-5615.

■ *Glen Head, N.Y.-based consultancy* **Outlink Market Research** *has prepared "The Firewall Report," an* **analysis of network firewalls.**

Outlink: (516) 759-5000.

■ **TriTeal Corp.** *of Carlsbad, Calif., is bundling Web server technology from Spyglass, Inc. with its TEDserver enterprise server and preparing a* **suite of compatible Internet applications.** *TEDserver 4.1 is scheduled to ship midyear, but a prerelease version is available now for $199, including a year of free technical support. The TriTeal Enterprise Desktop (TED) already integrates the Spyglass client technology, and TriTeal also markets the TEDVision browser.*

TriTeal: (619) 930-2077.

EDI translators are not created equal

By Ellen Messmer
Nashville

When it comes time to purchase electronic data interchange software, it's "buyer beware," according to one experienced EDI user.

At the recent Financial EDI conference here, merchandising giant Dayton Hudson Corp. outlined its approach to buying an EDI translation application — the big-ticket software that is crucial for sending and receiving business data between trading partners.

ON-LINE

Link to Network World Fusion to download a guide to EDI software vendors. Select News+ then Electronic Commerce.

http://www.nwfusion.com

Here's how a translation system works: First a translator takes corporate applications data and converts it into the standard ANSI X12 format or other EDI modes. Then that data is sent to a mailbox defined by a value-added network (VAN) or bank.

But all EDI translators — which cost tens of thousands of dollars — are not created equal.

In fact, EDI translators vary greatly in the daily message volume they handle, the standards versions they support, and their mapping and audit tools, according to Larry Jones, Dayton Hudson's EDI strategic planner. This capacity is important. "If you're a big company, you could easily be doing 50,000 to 100,000 invoices daily," Jones said.

The issues are not just technical. "Before you select a translator for the mainframe, PC or Unix, you need to understand the impact EDI will have across departments, on your warehouses, your distribution centers and your accounting," Jones told conference attendees. Planners also need to know their trading partners' intentions since they each may use different ANSI X12 EDI versions and your translator will have to support them.

"At Dayton Hudson, we need to find out on a yearly basis what will be our commitment to EDI for the year," Jones said. "And we do a once-a-year change in standards."

Some EDI software supports a limited number of trading partners. Dayton Hudson discovered this pitfall when its software, limited to 300 trading partners, quickly became obsolete after its use of EDI burgeoned. "We were stuck with it," Jones said.

Jones pointed out other distinctions users should make selecting EDI packages.

Some EDI translators come bundled with mappers that take X12 data and map it to specific applications, but others don't.

Some EDI software is sold as load modules that can be altered by in-house programmers, while other vendors sell code that cannot be altered without forfeiting vendor liability for it. And some products allow for multiprocessing through SQL, while others are single-threaded to databases.

Users will probably want to look for products that track activity of EDI transmissions and log changes, Jones said. It is also important that users find out whether the EDI software they want to buy is set up with a direct connection to multiple VANs and banks, or just one.

Buying the right EDI translation software

- ▶ Evaluate the initial and long-term impact electronic data interchange is likely to have on your organization to determine the daily message volume the EDI translator will have to handle.
- ▶ Find out what EDI versions your trading partners are using and whether your EDI translator can support them.
- ▶ Find out if the EDI translator performs EDI mapping.
- ▶ Find out if the translator supports multiple VAN connections.

"Otherwise, you'll pay inter-network fees to everyone in the middle," Jones said.

Optimally, EDI systems should be set up from the beginning to provide report generation on-line and in print so the data can be viewed in its raw form or combined to present a profile of each trading partner's EDI activity.

More sophisticated EDI translators contain scheduling mechanisms that can pull the most critical EDI messages out of a queue and treat them as a priority. And getting an EDI translator that compresses data will decrease expenses since VANs usually charge by the kilobyte.■

Unix heavy SCO puts its weight behind the Internet

By Peggy Watt
Sana Cruz, Calif.

Unix veteran The Santa Cruz Operation, Inc. (SCO) is staking out some cyberspace by "Internet-enabling" its line of Intel-based Unix products and services.

A server management product, SCO Doctor, is being enhanced to monitor Web servers and Internet communications for administrators. During the next few months, SCO also will unveil a browser, common Internet applications such as a mail server and File Transfer Protocol server, and remote management functions and security enhancements to its current line, from desktop to server.

SCO already ships a Web server with its OpenServer development system, but will add multiple domain support and a dynamic IP filter. Some new products will incorporate the UnixWare technology SCO recently acquired from Novell, Inc., said Richard Treadway, vice president of SCO's layered server products division.

Treadway *says SCO's Internet technology enables 'two-way communications between customers and businesses.'*

"Corporations are deploying Internet technology today in the same paradigm, but it offers many opportunities for two-way communications between customers and businesses," Treadway said. SCO will apply Internet technology throughout its product line to help businesses use the Internet to extend critical business functions, he said.

SCO will leverage its current network of value-added resellers (VAR) and systems integrators, stressing service and support as well as products.

Resellers welcome the new products because "we've had some curiosity and questions" from customers interested in Internet technology, said Bob Griffith, hardware and service manager for SCO VAR Bell & Howell Lightspeed, Inc. in Salt Lake City.

Another reseller, Computing Devices Canada, said the products are also suited for an application they have in mind: an intranet at a military site that avoids outside links.

"We might have use for a lot of the facilities used on the Internet, but in a closed system," said Susan Children, business development manager for Computing Devices.

Initially, SCO will resell other vendors' Internet products tailored to integrate with SCO Unix. Those licenses include the Inetix client and gateway program from Micro Computer Systems, Inc.; several Netscape Communications Corp. servers and the Navigator browser; and Morning Star Technologies, Inc.'s point-to-point software, which includes gateway security and support for virtual private networks on a single host.

SCO: (408) 425-7222.

Hummingbird sets sail with Columbus

By Ellen Messmer

Mountain View, Calif.

Hummingbird Communications, Ltd. is now shipping Columbus, a Web-based document management and publishing system aimed primarily for use on an organization's internal IP network.

The system's proprietary features, however, have some users wary.

The tool, though new, is not exactly homegrown. Hummingbird late last year purchased Common Ground Software, Inc., the creator of the portable document format DigitalPaper. Columbus, a World-Wide Web client/server publishing system that converts HTML format into DigitalPaper, is based on this technology.

The ambitious aim is to actually supplant HTML for some applications. In fact, the company hopes Columbus will be the vehicle that makes DigitalPaper, which can take any Windows application file and preserve the exact appearance of it, take off as the de facto portable document standard for internal Web sites.

HTML may not be so easy to shake. NationsBank and Stanford University, both big DigitalPaper users, said they are hesitant to set up internal Web networks based on a proprietary format.

"We use DigitalPaper, but we also use Adobe Acrobat and plain text," said Tom Goodrich, Stanford's manager of information technology systems and services. "We're committed to maintaining as open an architecture as possible, so I don't see using [Columbus] as the integral service because it's proprietary."

Stanford operates a Web site where university information can be accessed by students via the campus Ethernet network or the public Internet, Goodrich said.

What to do

What's bad for Stanford could be good for others. In fact, Goodrich suggested that small and midsize businesses — which can often standardize on a single document format more quickly than large organizations can — may want to set sail with Columbus.

The Columbus package includes a Web browser that integrates File Transfer Protocol, telnet, Multi-purpose Internet Mail Extensions electronic mail, news, an HTML and a DigitalPaper reader. It also has a Personal Web server so users at their desktop can post files in DigitalPaper format for others on the network to read.

The Columbus Application Suite also has a search-engine utility for unassisted capture, retrieval, indexing and storage of Web documents.

Another Columbus component is a centralized Web management server that can convert HTML documents into DigitalPaper format, store them for access or broadcast them automatically across the IP network.

The server's contents are stored as an HTML file, and network managers can set up security controls to prevent unauthorized access to particular pages. The administrative features in Columbus permit the installation, configuration and management of every desktop from the central server. It also provides a way to automate Web document collection when the user is absent.

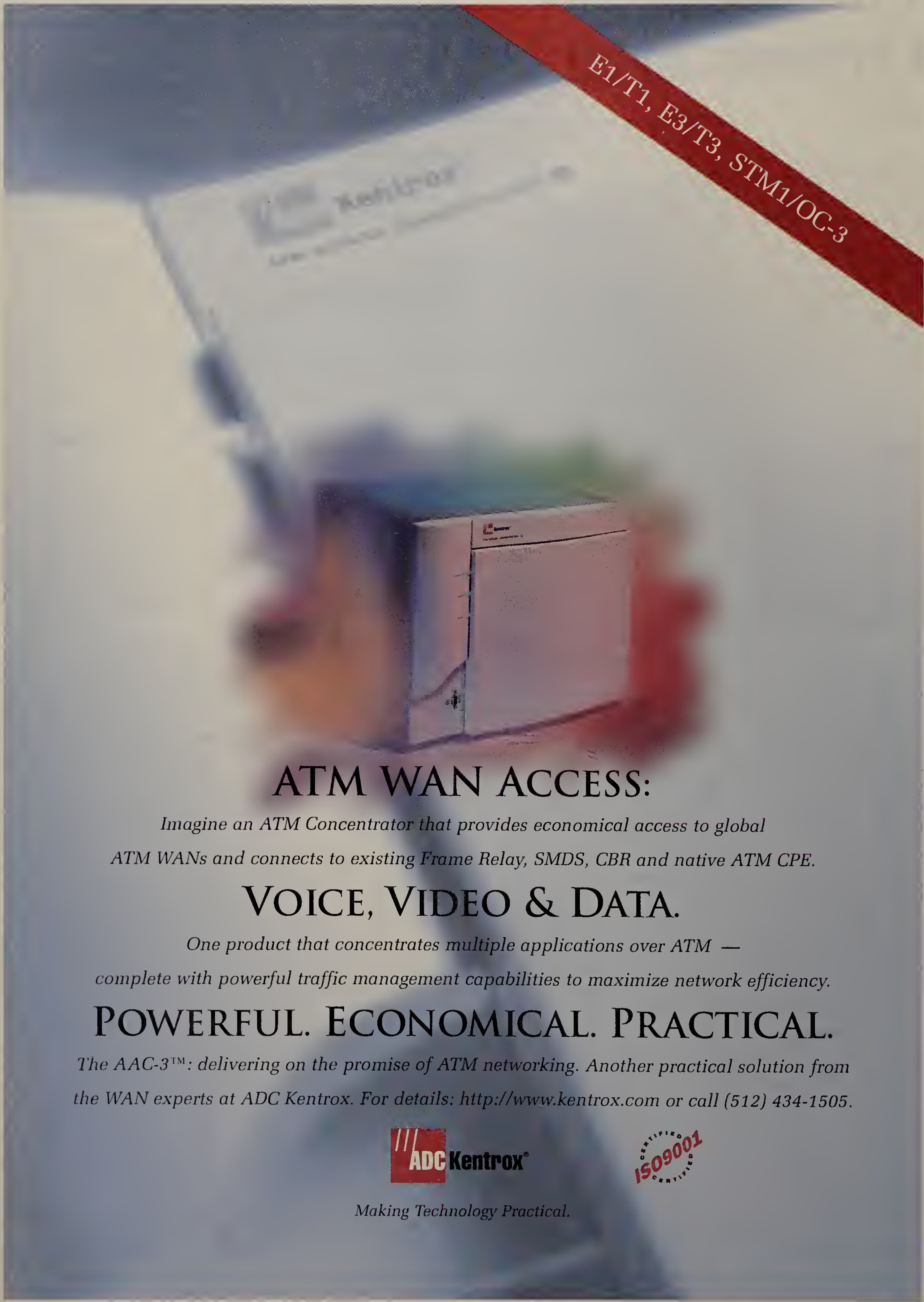
DigitalPaper is a good choice as the corporate standard for Web publishing since this portable file format has several advantages over HTML, argued Peter Auditore, Hummingbird's director of marketing.

DigitalPaper will allow for an accurate graphical representation of a file while HTML cannot, Auditore said. For instance, if you convert a file into HTML, sometimes formatting items such as columns can be lost.

He added that users will not need a DigitalPaper viewer on their desktop because every DigitalPaper file that is created has an embedded Miniviewer for reading the document. The Columbus Proviewer, however, is needed to modify the document.

The Columbus Web desktop application with viewer costs $189 per user, with the automated publishing distribution system costing $2,500.

©Hummingbird: (415) 917-7310.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Periodically, we answer a frequently asked question. Here's one:

How can I block access to certain World-Wide Web sites?

You can use software to filter out sites your organization deems inappropriate, says Wayne Spivak, president of SBA.NET.WEB, an Internet consultancy in Bellmore, N.Y.

You can also establish the same type of rules that define acceptable uses for office equipment, such as copiers, facsimile machines and phone systems.

Two products that provide screening or blocking of electronic mail to certain addresses as well as access to specific Internet newsgroups, Gopher servers, file archive sites and Web sites are SurfWatch from SurfWatch Software, Inc. and Cybersitter from Solid Oak Software, Inc. Both products use a TCP/IP filtering system to prohibit connections to inappropriate sites from company-owned workstations.

Both products include a database of sexually explicit sites that can be automatically filtered out. You can also add other sites to a restricted access list. In addition, the products use algorithms to scan key words utilized in accessing sites, to further stymie workers in their pursuit of access to sites deemed inappropriate or unproductive.

Follow-up

In a recent Network Help Desk (Jan. 22, page 39), we advised a reader to check the LASTDRIVE statement in the config.sys file of NetWare's workstation-based Virtual Loadable Module to overcome problems in navigating network drives and directories.

If you have similar problems, James Unroe, manufacturing engineer at Carlisle Motion Control Industries, Inc. in Bloomington, Ind., says you may also want to make sure the net.cfg file has the following line: Show Dots = On.

This will enable you to navigate a network drive with the "double dot" command that jumps you back one directory level.

New token-ring standard to boost bandwidth

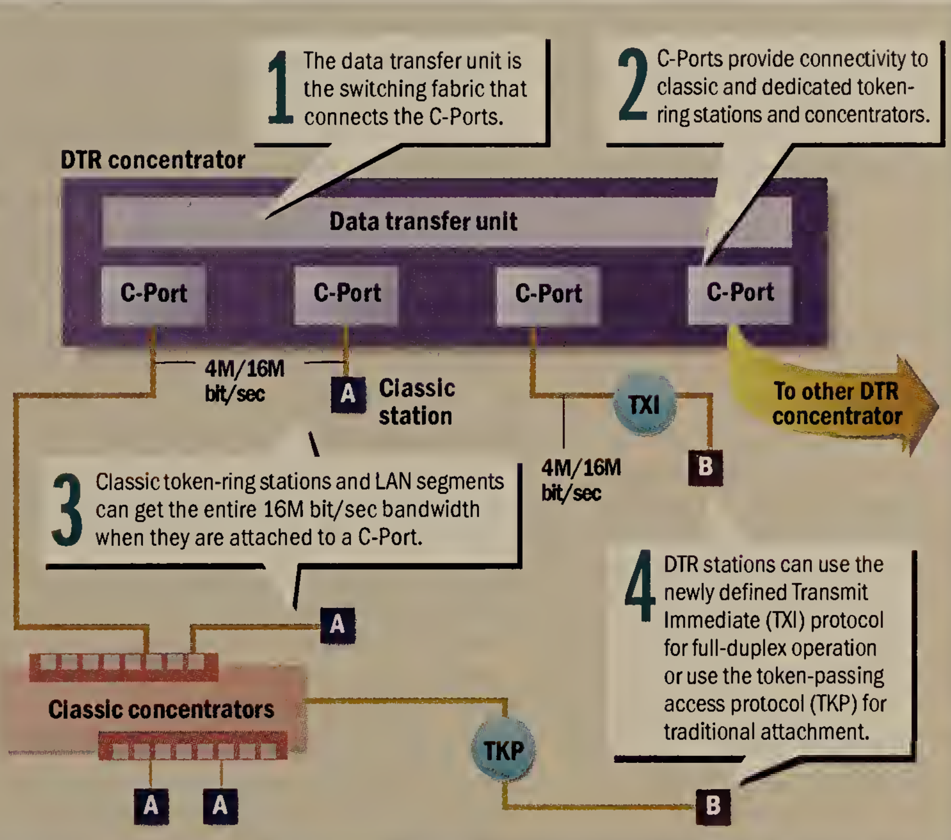
By Robert Love

Although most token-ring networks operate well below capacity, the day will soon come when applications push them to their limit. Never fear, the IEEE 802.5 committee already found a way to deliver a substantial performance increase while maintaining compatibility with the installed base.

UP CLOSE

The new token-ring architecture

The IEEE's impending switched token-ring standard, 802.5r Dedicated Token Ring (DTR), defines new attachment topologies and a full-duplex signaling protocol that will deliver the full 4M or 16M bit/sec of bandwidth to endstations. Classic and DTR stations and concentrators can be mixed in the same network.



1 The data transfer unit is the switching fabric that connects the C-Ports.

2 C-Ports provide connectivity to classic and dedicated token-ring stations and concentrators.

3 Classic token-ring stations and LAN segments can get the entire 16M bit/sec bandwidth when they are attached to a C-Port.

4 DTR stations can use the newly defined Transmit Immediate (TXI) protocol for full-duplex operation or use the token-passing access protocol (TKP) for traditional attachment.

Its answer lies in the impending switched token-ring standard, called 802.5r Dedicated Token Ring (DTR). The DTR standard defines requirements for new endstations and concentrators, and it specifies a protocol for full-duplex operation. All will coexist with existing token-ring equipment and the token-passing access protocol.

The DTR concentrator consists of C-Ports and a data transfer unit (DTU). The C-Ports provide the basic connectivity from the device to token-ring stations, classic concentrators or other DTR concentrators. The DTU is the switching fabric that connects the C-Ports within a DTR concentrator. In addition, DTR concentrators can be linked to each other over a LAN or WAN via data transfer services such as Asynchronous Transfer Mode.

A LAN segment on a classic concentrator can be linked to the rest of the network by attaching a DTR C-Port (operating in station-emulation mode) to any available lobe on the device. This small segment is then given the entire 16M bit/sec token-ring bandwidth.

DTR-enabled endstations will operate identically to existing token-ring stations when attached to a classic concentrator. Using the new access protocol, called Transmit Immediate (TXI), they also can operate in full-duplex mode when attached to a DTR concentrator.

Migration to DTR

Bringing DTR equipment into an existing token-ring environment will pump up the amount of available bandwidth. Consider a 16M bit/sec token-ring network that provides each of 80 stations with an average bandwidth of 20K bit/sec. You can gain an eightfold increase in capacity, to 128M bit/sec, by dividing the network into eight token-ring segments and connecting each one to a DTR concentrator port.

In this scenario, the average bandwidth for each endstation increases to 1.6M bit/sec without changing a single adapter or concentrator. Coupled with the priority capability inherent in the token-ring architecture, this bandwidth is more than sufficient for today's high-bandwidth requirements and can handle time-critical multimedia applications.

Emerging data-intensive, video and collaborative computing applications will not tolerate the bandwidth or timing limitations of shared-media LANs. You can provide 16M bit/sec of dedicated bandwidth to existing token-ring stations by directly attaching them to DTR concentrator C-Ports. The combination of high bandwidth and 100% channel availability will make it feasible to handle these types of applications in a token-ring environment.

Long before your applications will require more than a dedicated 16M bit/sec channel, you will have replaced your endstations with next-generation high-powered PCs and workstations. You would then populate these machines with DTR-enabled adapters so that when they are connected to a DTR concentrator port, they can run in full-duplex mode, providing up to 32M bit/sec of total available bandwidth to and from the station.

Since both full-duplex and classic token ring use standard token-ring frames, the application code that runs on classic token ring will run on DTR. This means you can migrate to DTR to improve your LAN's performance without rewriting code or retraining users.

Status report

The IEEE 802.5 committee is currently finalizing the DTR standard. All major DTR implementors have been participating in its creation while developing products.

Following the advice and encouragement of the Alliance for Strategic Token Ring Advancement and Leadership (ASTRAL), an independent lab already has completed two rounds of interoperability testing on prototype products. The University of New Hampshire's token-ring testing center conducted the tests. This early test program is unprecedented in standards development and provides a high level of confidence in the standard and initial DTR products. It has resulted in minor improvements to the draft standard and emerging DTR products.

As a result of this new standard from IEEE 802.5, you will see DTR-enabled adapters and concentrators early this year from virtually all of the major token-ring vendors. These products will have the benefit of early interoperability testing and of token ring's outstanding reliability and network management to let you easily and confidently add the bandwidth needed for coming applications using token-ring switching technology.

Love is a senior engineer at IBM in Research Triangle Park, N.C., vice chairman of the IEEE 802.5 group and an active participant of ASTRAL. He can be reached at dlove@vnet.ibm.com.

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EDITORIAL INSIGHTS

That mysterious ROI

At last week's ComNet '96, *Network World* and META Group held a roundtable with readers on benchmarking network operations. (The full article will appear in a future issue.)

One thing was clear: Despite management's insistence on solid return on investment (ROI) data to justify expenditures and the best efforts of IS execs to nail down numbers, proving ROI remains a very tricky job.

Even the most sophisticated customers struggle with ROI. Ryder System, one of our 1995 User Excellence Award winners, has developed an impressive distributed asset management system that is helping to increase profits from its leased trucks. At least it appears to be. But Ryder network executive Jim Hamilton concedes other factors beyond Ryder's control — changes in the economy and missteps by competitors — may also be at work. It's tempting to pin the improvements on network investments, but that's only one factor in a complex equation.

META Group's Joaquin Gonzalez says the best way to judge the payoff from your network spending is to survey the business units you serve. (As former New York Mayor Ed Koch used to ask his constituents, "How'm I doin'?") If they're happy with your service and can help you fine-tune it, all's right with the world.

That's a sound approach. The survey gives your customers a forum — a kind of relief valve — for expressing concerns and ideas, and can help create a sense of partnership. It can provide more direction than some cold ROI calculation that only offers you a snapshot in time.

One limitation: Don't expect customers to come up with those "Wow!" ideas for new applications. It's still up to you to envision technical solutions to their business problems. For help there, take a page from the book of Pacific Gas & Electric CIO John Danielson, who recommends regular "line-of-sight" meetings with business units. By getting a better understanding of where they see the business going, you'll find it easier to develop new applications.

Another concern is that this customer feedback may be too soft for upper management to hang its hat on. If it's hard numbers they want, how do you please them? What's your solution to this ROI puzzle? Drop me a line.

John Gallant, editor in chief jgallant@world.std.com

Teletoons

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Phil Frank

ABOVE THE CLOUD

Supercarrier concept is long on hype and short on relevance to user needs

James Kobielus

The telecommunications industry is bracing for the advent of supercarriers, the new generation of integrated service providers that will emerge when, and if, Congress passes the long-awaited deregulation bill.

Deal makers are salivating at the prospect of multibillion-dollar mergers, acquisitions and alliances involving providers of all stripes. Federal, state and local regulators are already straining to address a growing docket of "crossover" petitions — telcos eager to provide video dial tone, cable television companies seeking to furnish switched voice service, and cellular operators interested in reselling long-distance services.

Yet, quite often, a merged firm turns out to be an underperforming shadow of its predecessors, an unstable isotope soon undone by irreconcilable differences. Look at yesteryear's ill-fated matchups — IBM/Rolm, AT&T/NCR, Sprint/United Telecom, MCI/British Telecom, General Motors/Electronic Data Systems and Bell Atlantic/TCI — for evidence of megadeals gone bad. Is it any wonder that we've become jaded about merger mania?

The basic truth is that users don't want one-stop shopping in most spheres of life. They're afraid — and rightfully so — of becoming captive to any one provider.

It's not clear what intrinsic competitive advantage a supercarrier would enjoy in any of the market segments served by its business units.

These behemoths might realize some efficiencies in purchasing, R&D, operations, marketing and billing. However, these benefits could very likely prove ephemeral, offset by the extra overhead needed to coordinate diverse services under one corporate umbrella.

Supercarriers might consider cross-subsidizing some business segments with profits from others. But such a strategy probably would blow up in their faces. Freewheeling competition and profit margins in all service markets will make cross-subsidization almost impossible. A supercarrier-affiliated service provider will not be able to rely on its well-heeled parent to fund a prolonged trench war against small, but determined, competitors.

Supercarriers could try to provide preferential interconnections among their affiliated service providers. However, this tactic would probably run afoul of regulators from the get-go. Even if it was tolerated officially, the practice would be shot down in the marketplace as carriers distinguish themselves by the breadth of their cross-service and cross-industry interconnections. For example, no supercarrier-affiliated cellular operator is going to risk driving customers away by telling them they can't place calls to users on competing wireless or terrestrial networks.

Supercarriers also could use unified cross-service brand names to leverage their marketing clout. This may become a powerful tool of supercarrier hegemony, but that's not necessarily in users' best interests. Cross-service brand names will simplify carriers' national marketing campaigns and play into Madison Avenue's science of mass persuasion. All of life's communications problems will be reduced to Pavlovian knee-jerk simplicity.

Just choose a communications mother ship — such as the AT&T, MCI or Sprint family of companies — and stick by it. The brand name will obscure whether these companies are providing the services from their own facilities or simply functioning as sales agents or resellers for services provided by business allies.

Some claim supercarriers could dominate based on their ability to provide users with one-stop shopping for access, transmission and information services. If accompanied by price discounts, consolidated billing and custom applications, this supercarrier "synergy" might appeal to some business customers. However, this may not be a burning issue among users.

Chances are, many users will continue to acquire different communications services from different providers. No one supercarrier can be expected to provide best-of-breed services in all categories. Besides, many telecommunications managers who cut their teeth in the postdivestiture era have grown to love multistop shopping. They will probably relish playing one supercarrier against another to get the best value for their telecommunications dollars.

The basic truth is that users don't really want one-stop shopping in most spheres of life. They're afraid — and rightfully so — of becoming captive to any one provider.

What can network managers do to prepare for the supercarrier era? Most important, judge supercarriers by the same criteria you've always applied to custom service packages: discount pricing, unified account management, streamlined ordering, speedy provisioning, consolidated billing, ubiquitous access, integrated network monitoring and nationwide service force. From the customer's point of view, the only meaningful synergies from cross-service industry consolidations are those that translate into tangible improvements in any or all of these areas.

The ultimate test of the supercarrier will be the speed at which it marshals its resources to respond to your every communications requirement.

If service suffers under the supercarrier's regime, you may want to consider going back to acquiring different communications services from different providers.

You may find it better to do business with the small and the swift than with the dinosaurs of this world.

Kobielus, a contributing editor to Network World, *is a senior telecommunications analyst with LCC, L.L.C., an Arlington, Va.-based network design and engineering firm. He can be reached at (703) 807-5075 or via the Internet at kobielus—james@lccinc.com. The opinions expressed are his own.*

NETWORK MANAGEMENT

Finally, a solution for a real problem

John McConnell

Netsys Technologies, Inc. deserves a tip of the hat for delivering a product that addresses a difficult management problem: operational management of a router domain.

A router domain is a set of devices that must work together to deliver traffic effectively. Even a small change in a single router's configuration may disrupt the entire domain, degrading service and requiring many hours to correct.

As a result, many network managers leave their router backbones alone once they are working acceptably. Rather than risk the disruptions associated with making changes to improve performance or respond to new demands, managers allow router backbones to become rigid and less responsive to supporting their organizations' networking requirements.

> *Netsys is following in the tradition of other small, aggressive companies that have provided the innovative solutions large vendors seem to be incapable of delivering.*

Managing a router domain is thus a complicated process. Router management tools have not addressed this complexity. For example, management information delivered from a single router agent does not provide the information needed for end-to-end understanding of complex internetwork behavior. Vendors such as Armon Networking, Inc., Axon Networks, Inc., Compuware Corp. and Frontier Software Development, Inc. have filled some of the gaps.

Netsys' Performance Tools product, released last month, offers net administrators an array of domain management capabilities. The product combines information from routers and Remote Monitoring (RMON) agents to give administrators new insights into problem solving and performance tuning, as well as providing automated help.

Performance Tools uses the router Management Information Base to collect, in snapshot fashion, real-time information on link loads and volumes. This preliminary information is used to automatically identify the places where further instrumentation is needed for complete coverage of the router backbone. Administrators often have difficulty determining proper placement of monitoring tools. Information from RMON agents is added to the router information to provide an integrated end-to-end view of the entire router domain.

In addition, automatic traffic baselining is provided in a way that minimizes management bandwidth and interruption of router operations. This means there is less traffic to interfere with real work and less degradation of router performance. Traffic information is refined into information on route loading, application usage, subnet traffic volumes, protocol loads and other operational information.

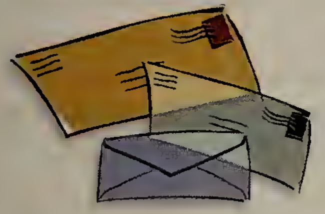
Performance Tools builds on the Connectivity Tools product Netsys delivered last year. A unique feature of Connectivity Tools is its ability to extract real router configuration data, which is used to automate the domain configuration process. Connectivity Tools is able to correlate configuration parameters from different routers, apply consistency checks across routers and check filtering rules to ensure proper operation.

Performance Tools provides modeling and analysis, allowing net managers to do the what-if exploration required to develop scenarios for improving performance or resolving problems. Tight integration with Connectivity Tools ensures that any suggested network topologies or changes in the domain are configured appropriately to produce the desired results.

The initial versions of Performance Tools and Connectivity Tools are for use with Cisco Systems, Inc. routers. Hopefully, future versions will work with routers from other vendors and incorporate switched fabrics, which share many of the same characteristics of router domains. Early beta-test results have shown Performance Tools to be a robust product capable of handling one customer network that has more than 1,200 routers.

Netsys is following in the tradition of other small, aggressive companies that have provided the innovative solutions large vendors seem to be incapable of delivering. Administrators struggling with managing a set of routers should take a look at what Performance Tools has to offer.

McConnell is president of McConnell Consulting, Inc., based in Boulder, Colo. He can be reached via the Internet at johnmc@mcconnell.com.



IN-BOX

Novell is to blame

Marc Myers' column "Don't count Novell out just yet" (Jan. 15, page 30) is one of several recent articles I've seen that have pointed out Novell, Inc.'s abysmal stock performance and then gone on to explain why the poor performance is not Novell's fault.

The reason for Novell's poor performance is most likely a direct, or indirect, response to Bob Frankenberg's vision. In an information technology (IT) world that is embracing more and more Internet-based technology and buying more standards-based systems, Novell is trying to bend the world to its will.

I can envision technology investors looking at Novell's NetWare Connect Services, NetWare SMP and NET2000 and asking themselves: How are these products strategic, how do they appeal to the mass IT market, and how will they endear Novell to the vast number of potential business partners? The answer: They do not and will not. In a day when the Internet is on everyone's lips, who cares about NetWare Connect Services?

Can Novell really create a pervasive network API that developers will embrace wholeheartedly? I submit that developers will be quite wary when it comes to trusting Novell's promises of development APIs and platforms. The industry, investors and the development community are tired of listening to the stream of "visions" that roll out of Novell every couple of months. Change is good and often necessary, but so is success. It has been a long time since Novell has had a real success.

Steve Jones
Manager of enterprise network services
Department of Mental Health
and Mental Retardation
Austin, Texas

Desirable hacking

Regarding Winn Schwartau's article "How to get mgmt. aid and snag that hacker" (Jan. 8, page 44): I was dismayed to hear that freelance hackers are not the only threat I have to contend with, but that the folks at the Defense Information Systems Agency (DISA) are also breaking into networks on taxpayers' dollars. Perhaps Schwartau can give us the specifics on this?

Wulf Losee
Network analyst
J. Paul Getty Trust
Santa Monica, Calif.

Schwartau replies: DISA's activities are very much legal and are highly desirable. The organization attempts to penetrate Department of Defense computers in an effort to make them more secure. It is far better for companies to find security holes themselves than to have them discovered by "the bad guys."

DISA employs hacking tools found on the Internet as well as those they develop themselves in order to understand the dynamic vulnerabilities they — and we all — face. Rather than worry about their efforts, we should applaud them.

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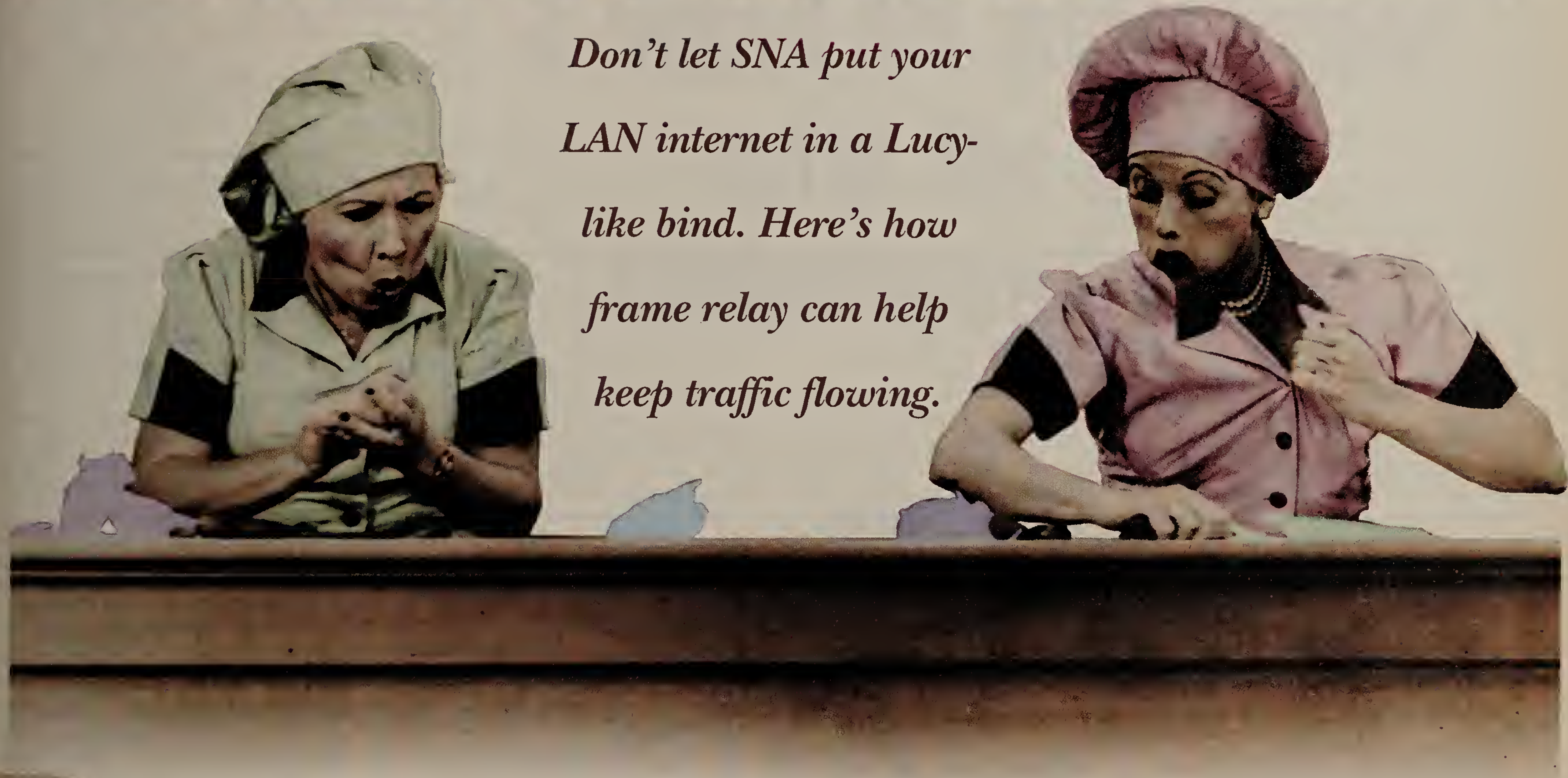


Don't let SNA put your LAN internet in a Lucy-like bind. Here's how frame relay can help keep traffic flowing.

By Anura Guruge

Response time and reliability are sacrosanct to mission-critical SNA applications. Consequently, your overriding concern when moving traffic from an SNA-only leased-line network to a multiprotocol internet is to ensure that the reliability and response attributes associated with SNA are in no way jeopardized.

Poor congestion control that results in packets being arbitrarily discarded is a major cause of performance fluctuations and session outages in bridge/router-based internets supporting SNA data, including Advanced Peer-to-Peer Networking traffic. This is particularly true in the case of IP-centric solutions.

But it doesn't have to be that way.

Conventional bridge/routers, as well as routers frame relay access devices (FRAD) that comply with the RFC 1490 specification, can be outfitted with software extensions that virtually eliminate the danger of SNA packets being discarded when used in frame relay nets. These extensions work with frame relay bandwidth provisioning mechanisms to meter SNA traffic as it is pumped into the WAN, ensuring data doesn't exceed predefined thresholds.

This metering minimizes or eliminates the risk that severe WAN congestion would cause SNA packets to be discarded. In turn, that guarantees crisp, consistent, predictable SNA response time and precludes SNA sessions from being disconnected by the mainframe due to repeated packet sequence number errors.

The dangers of discarding

Bridges and bridge/routers are not noted for such sophisticated congestion- and flow-control mechanisms. While some vendors have implemented features intended to let you give certain types of traffic priority over others, their features do no good once the device's buffer is full. At that point, it will accept no more packets, so prioritization schemes never enter the equation; instead, packets are discarded.

SNA and APPN, in marked contrast, set out to prevent congestion from happening in the first place by continually governing the amount of new data entering the network. This is done using techniques such as session-level pacing and Layer 2 receive ready (RR)/receive not ready (RNR) flow control.

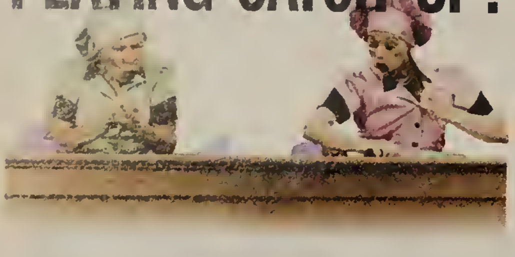
All SNA interactions are session-based, or connection-oriented, with all data delivered end to end, error-free and in sequence. The loss of a data packet always results in the disruption of end-to-end data flow, while retransmission processes are invoked to recover the lost message unit and resequence the data flow.

Fortunately, SNA frames dropped by a router that is experiencing congestion will not typically cause data loss or transaction errors. SNA sequence numbers at Layers 3 and 4, as well as application-level transaction numbers, ensure that any discarded SNA/APPN message units are retransmitted and recovered. However, while such retransmissions ensure data integrity, they can wreak havoc on response time and reliability.

That's because SNA and APPN, like TCP/IP, do not support the notion of selective rejects — the ability to request the retransmission of a single discarded or damaged packet or frame. Instead, SNA, APPN and TCP/IP only acknowledge the packets up to the first packet discarded or damaged. So all packets — starting from the discarded or damaged one, up to the end of the acknowledgment window cycle — have to be retransmitted.

This can quickly create a snowball effect, the severity of which depends on two factors: the size of the original acknowledgment window and the position within this window of the first discarded packet. The larger the window size and the earlier within the window the first discarded packet appears, the larger the number of packets

PLAYING CATCH-UP?



that must be retransmitted.

The recovery time needed to resend all the necessary packets, easily 3 to 5 seconds, leads to erratic response times.

The cost of poor response time

The normal and acceptable response time per terminal interaction may be .5 seconds. Then, a retransmission occurs to recover a discarded packet. Operators sit with their terminals or PCs locked while the discarded packets are recovered and the datastreams are resequenced. The response time for the disrupted interaction may be in the 3.5- to 6-second range. With luck, response time reverts to .5 seconds for a few minutes before another packet gets dropped and response time shoots up again.

This erratic, yo-yo response time would occur right through the day, every day, frustrating users and disrupting their work patterns.

Clearly, that scenario is bad news for mission-critical applications where time is money, such as travel reservation systems, financial brokerages and mail-order applications.

Many SNA devices, such as front-end processors and IBM Application System/400s, also do not deal well with packets delivered out of sequence, as would be the case if packets were dropped as a result of congestion. Most of these devices were developed when leased lines were the norm for SNA networks. While a packet may get corrupted during transmittal on a leased line, it is highly unlikely that packets would be dropped, resulting in out-of-sequence packet delivery.

Consequently, some SNA devices will disconnect a session and attempt to reestablish it if they detect repeated out-of-sequence deliveries, on the assumption that the connection is bad. Such session disconnects further disrupt the orderly work patterns of end users — leading to even greater losses in productivity.

The need to deal with such SNA idiosyncrasies was never a consideration during the early days of bridge/router technology; SNA was a whole different world. When it became commercially prudent, if not imperative, to support SNA, router vendors tried their best to do so using either straight bridging techniques such as source route bridging or by encapsulating SNA message units within IP datagrams, such as with Data Link Switching.

Given that SNA was always thought of as subservient to IP, the congestion-control mechanisms of bridge/routers were never modified to accommodate SNA applications (see story, page 38).

Arbitrary packet discard is still the preferred technique to circumvent buffer depletion caused by congestion. In a typical bridge/router network, it would not be unusual to find that 10% to 15% of the overall traffic is being routinely discarded to cope with congestion, resulting in wildly erratic response time and a constant danger of session disconnects (see story, this page).

If the network is implemented using frame relay services, the chances of packets being arbitrarily discarded increase. Many routers are not aware of, or don't pay sufficient heed to, the bandwidth control parameters of frame relay networks. These parameters include the committed information rate (CIR) as well as the committed Burst Size (Bc), which is the amount by which you can exceed the CIR in a short period of time.

In such cases, many users opt to relieve congestion by overengineering the network, which involves allocating large amounts of additional bandwidth. But this can be a very costly Band-Aid, given that the monthly charge for a T-1 link can be an order of magnitude greater than that for a 56K bit/sec line.

A much more cost-effective and efficient approach would be to minimize packet discards by implementing a powerful flow-control mechanism.

With a multiprotocol LAN/WAN internetwork built around frame relay, routers or FRADs can minimize the possibility of dropped packets by assiduously staying within the CIR and Bc specified for each virtual circuit. To ensure that sticking to these output bandwidth limits does not result in large output queues chewing up all available buffer space, judicious RR/RNR-type flow control must be used on the input ports.

Such input flow control can be easily applied to SNA, APPN, Binary Synchronous Communications and asynchronous traffic since they all use Layer 2 protocols that include some form of flow control. In networks supporting large volumes of SNA traffic, controlling the flow of just that traffic may be sufficient to preclude buffer overruns.

The overall structure of a frame relay-based multiprotocol solution will be similar to that used in a router net (see graphic). The key difference is that the remote sites will be connected to the central site containing the mainframe via a frame relay network, made up of frame relay switches, rather than via a router-based backbone.

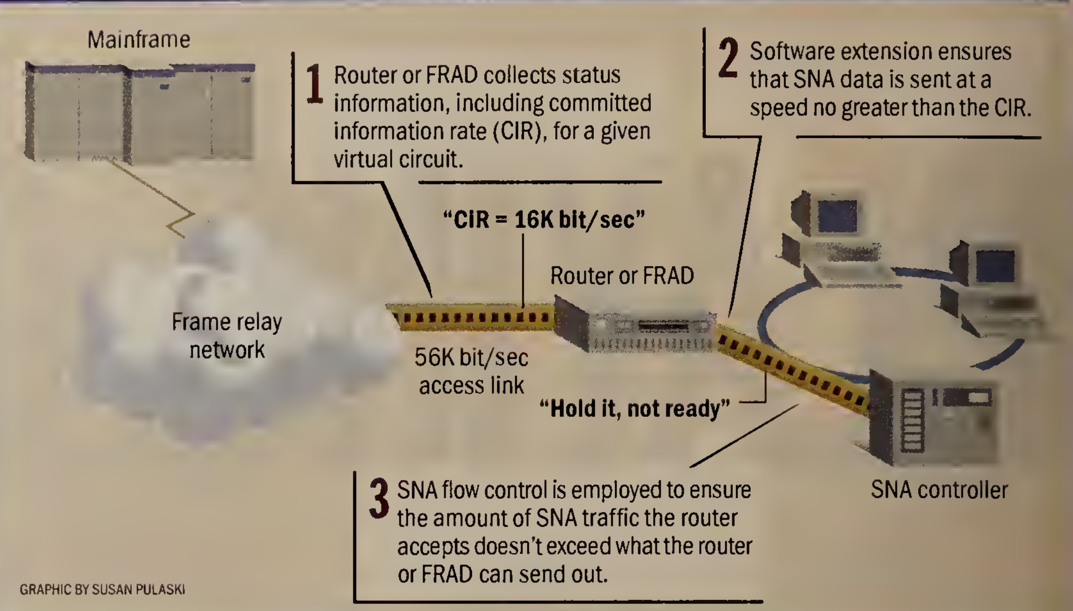
In this type of frame relay solution, it will be common for the CIRs of the virtual circuits going to the individual remote sites to be slower than the speed of the physical access links used between the remote sites and the frame relay network.

For example, all the access links may be 56K bit/sec, but the virtual circuits may have a CIR of only 16K bit/sec. In many cases, these 16K virtual circuits would replace 9.6K bit/sec leased lines that already provide good response time; there may not be a need for more bandwidth. Moreover, a virtual circuit with a CIR of 56K or 64K bit/sec will cost three times more than one with a CIR of 16K bit/sec.

And while in multiprotocol LAN applications it's advantageous to burst above the CIR up to the speed of your access link, that's not necessarily so with SNA/APPN. The traffic that exceeds the CIR may be discarded if the net is congested.

That's because frame relay services always reserve the right to arbitrarily discard frames within the WAN to alleviate unexpected congestion. However, steps

SNA under control



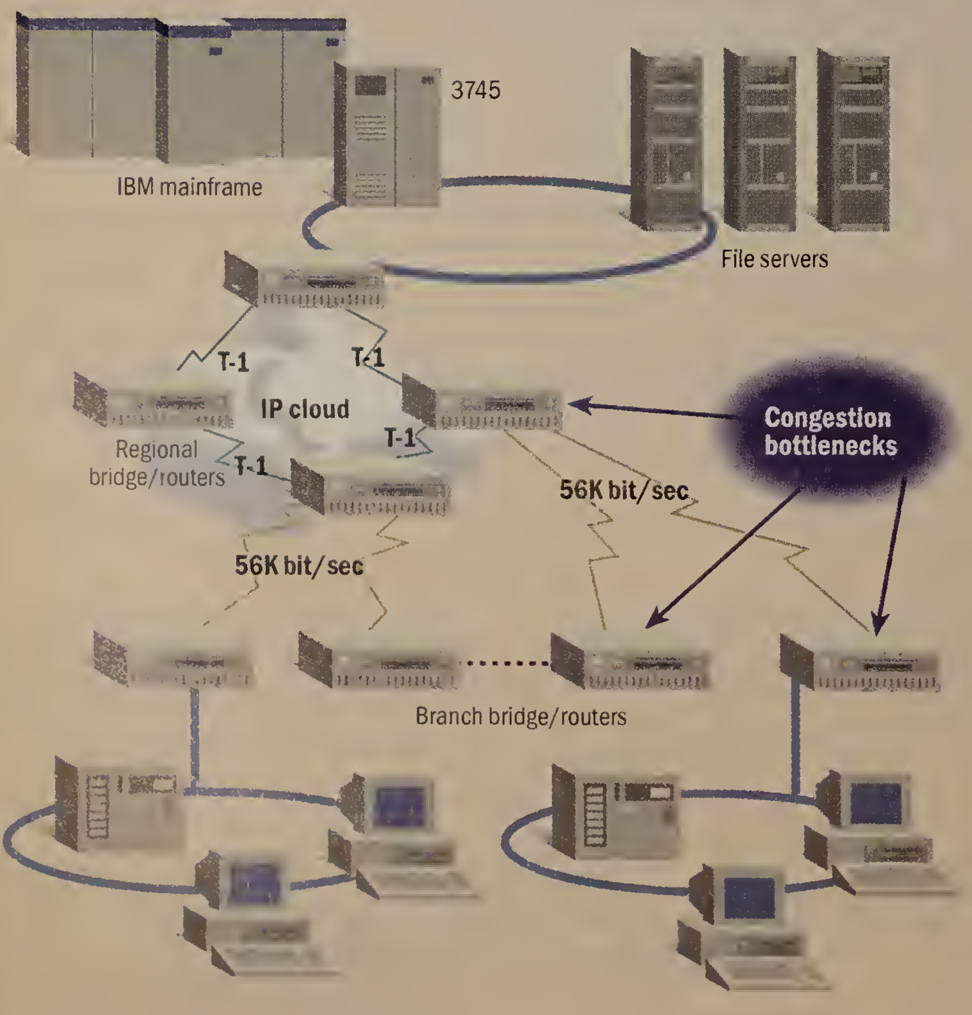
1 Router or FRAD collects status information, including committed information rate (CIR), for a given virtual circuit.

2 Software extension ensures that SNA data is sent at a speed no greater than the CIR.

3 SNA flow control is employed to ensure the amount of SNA traffic the router accepts doesn't exceed what the router or FRAD can send out.

GRAPHIC BY SUSAN PULASKI

THE CONGESTION CONUNDRUM



This diagram demonstrates how multiprotocol router internetworks installed to replace what were SNA-only networks are subject to crippling congestion at various points.

Let's assume the branch-level routers at 56K bit/sec to communicate with a regional router speed equivalent to 7K byte/sec.

A PC interacting with a mainframe-based SNA application will typically use 2,000-byte packets, pumping them out one after another in the case of file transfers, for example. The PC will send data using an acknowledgment window size of at least eight packets and, in some cases, even 12 or 14 packets. With a window of eight packets, a PC user could send 16K bytes of data across the LAN in a couple of seconds. Hence, a single PC could easily send more SNA/Advanced Peer-to Peer Networking data than the departmental router can transmit over its 56K bit/sec link.

Now consider that multiple PCs all transmit data at the same time to a departmental router, which in turn continually churns out peak traffic loads to a regional router. With no effective congestion control mechanism in place, it is easy to see how this type of network would end up discarding 10% to 15% of the overall traffic.

are taken not to discard frames that fall within the CIR of a given virtual circuit. Instead, whenever possible, frame relay devices attempt to cure congestion by only discarding frames that are outside the CIR and are marked discard-eligible.

Until now, the problem has been that most bridge/routers and FRADs don't know the CIRs of the virtual circuits they are dealing with. They use the full bandwidth of the physical access line without heed to whether the speed of the access link over a given time period exceeds the CIR of the virtual circuits involved.

NetworkWorld Fusion http://www.nwfusion.com

Select NetRef, Technology Resources, then Mainframe communications and you'll find:

- Links to a white paper titled **"Frame Relay: Playing a Lead Role in SNA and LAN Internetworking,"** by Rocco DiCarlo of Motorola Information Systems Group, Network Systems Division. The paper provides a good discussion of frame relay basics and explains the general benefits of frame relay with respect to SNA.
- A connection to **Steve Neil's Frame Relay Resources page.** Neil has established links to a host of resources, including a frame relay FAQ and info on equipment and service providers, books, magazines and courses.
- **Previous *Network World* stories by Anura Guruge:** "SNA Battle Royal," which compares the merits of the RFC 1490 specification and Data Link Switching, and "SNA Battle Royal, Part II," which adds APPN to the mix, explaining how any of the three technologies could be used to build an SNA-capable multiprotocol network.

Take, for example, a 16K virtual circuit that is supported via a 56K bit/sec access link. If its output buffers were full, a router or FRAD might continue to send data into the network at 56K bit/sec irrespective of whether the CIR was being exceeded.

If SNA/APPN traffic is sent in this manner, there is a very real danger that packets falling outside the CIR will get discarded.

Help on the way

The good news is that some FRADs — from the likes of Hypercom, Inc., Jupiter Technology Corp. and Netlink, Inc. — and, in the near future, bridge/routers from vendors such as Cisco Systems, Inc., now have a software extension to prevent SNA traffic from being shipped out at speeds that exceed the CIR.

In order to do this, the FRAD or router must first determine the CIRs of the virtual circuits involved. Vendors typically use one of two methods for accomplishing this.

The first is to employ a local management interface network management protocol, dubbed STATUS ENQUIRY/STATUS, to request status data from a frame relay node, including the parameters of each virtual circuit the node supports. Or the device could use the frame relay Appendix D network management scheme — with vendor-specific extensions, if appropriate — to solicit this information directly from the remote bridge/routers or FRADs. CIR parameters could be manually configured during the installation process.

Irrespective of the method used, the central-site router or FRAD, as well as all the remote devices, can gain access to the relevant CIR and Bc data pertaining to the virtual circuits they have to support.

The devices also know the speed at which they can drive the access link — usually via an administrator-specified parameter, such as port speed.

The new software extensions kick in when the link speed exceeds that of the CIRs of the virtual circuits being supported across that link. When activated, the software starts measuring the rate at which data is sent over the access link.

In the case of SNA/APPN traffic, the software ensures that the data is sent at a rate no greater than that of the CIR, thus minimizing the possibility of frames being discarded.

Adhering to this strategy means there

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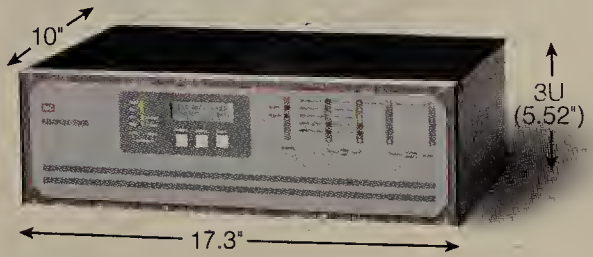

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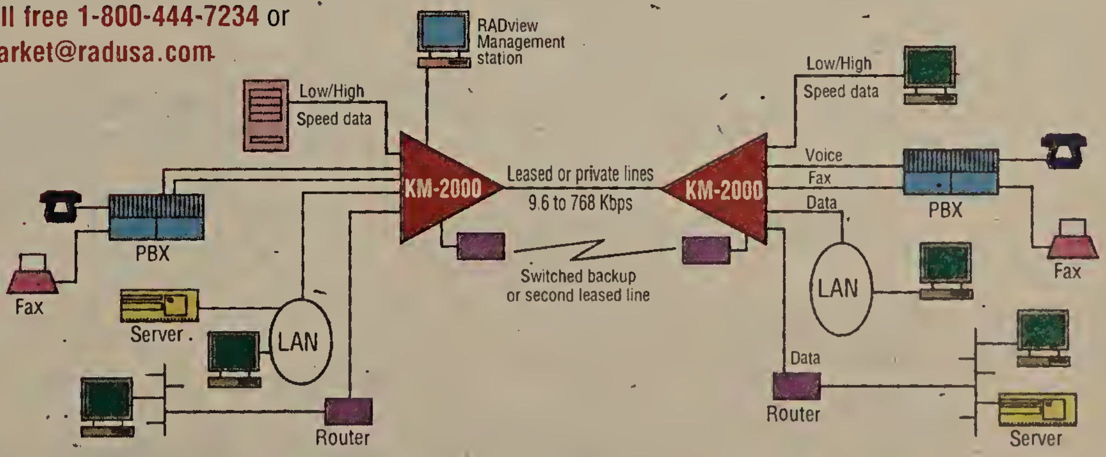

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PLAYING CATCH-UP?

will be periods during which SNA traffic cannot be sent across the access link, which could lead to a buildup of SNA data within the FRAD. To preclude that, the FRAD or router will judiciously employ the RR/RNR protocol to control the amount of SNA traffic it accepts, ensur-ing it matches the volume of frames it is sending out. In that fashion, the device can ensure that its buffers are not depleted by a buildup of queued SNA packets.

Sending non-SNA traffic on demand, even if the CIR has been exceeded, is an option. Such traffic runs the risk of being discarded.

Netlink takes this notion a step further with the concept of an adaptive scheme. Whether frames are discarded by a frame relay WAN is contingent on the level of congestion being experienced at a given time.

If there is no congestion, the WAN will permit you to routinely exceed the CIR, provided that the number of frames being discarded does not exceed a predefined threshold.

Once the discard threshold is reached, the device throttles back and keeps the SNA/APPN traffic within the CIR for a predefined period before testing the CIR limit again.

In either case, you now have a disciplined networking solution that stays within the permitted bandwidth envelope and consequently does not run the risk of having packets arbitrarily discarded.

If the volume of traffic in this type of no-discard network significantly increases, there will be a slight, corresponding increase in response time, reflecting the extra time taken to deal with the additional traffic without violating the bandwidth limits. Thus, if response time was .5 seconds, it may rise to .6 or even .8 seconds — not the 3.5 seconds or greater that will occur if packets were being discarded.

This type of frame relay based no-discard solution is already in production use. With more FRAD vendors and even some bridge/router vendors intending to offer this approach, such networks may soon become the norm for SNA/APPN applications. This would indeed be good news for both SNA users and network administrators.

Guruge is an independent consultant specializing in internetworking and IBM network architectures. He writes extensively, presents seminars worldwide and can be reached at (603) 878-1303 or via the Internet at aguruge@mcimail.com.

The IP difference

Given that routers were invented with IP in mind and not SNA, it's important to consider the differences in the way the two deal with congestion.

IP is a connectionless protocol, meaning it does not use the concept of sessions and packet sequence numbers.

Rather, it is a datagram-based scheme that does not guarantee the delivery of message units. If guaranteed delivery is required, a protocol such as TCP has to be used on top of IP.

Packet discard-based congestion control is consistent with IP's connectionless mode of operation. Since delivery is not guaranteed, discarding a few frames to alleviate congestion has no explicit impact on IP.

SNA and Advanced Peer-to-Peer Networking, by contrast, only operate in delivery-guaranteed, or connection-oriented session mode, which revolves around the use of sequence numbers and in-sequence delivery.

Data Link Switching, a scheme for carrying SNA data over IP nets, in no way stops bridge/routers from arbitrarily discarding packets — including SNA/APPN packets. It merely provides a mechanism for recovering from such packet discards.

—Anura Guruge

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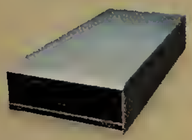
Scrambling frame relay

You can get high security for frame relay connections, but it comes with a performance penalty.

By Jonathan Torta

NetResults

Product
FPX4802/DES Frame Relay Encryptor



Vendor
Cray Communications, Inc.
(800) 367-2729

Price as tested
$4,495

Pros
- ▲Can select DLCIs to be encrypted
- ▲High level of security with 64-bit DES

Cons
- ▼Delayed network traffic by 40%

Frame relay networks tend to be extremely secure, but for those who need additional assurance, encryption constitutes another layer of security that can be used for highly confidential information.

Encryption, however, often slows down throughput, which is a concern for those employing frame relay. To test how encryption can affect performance on a frame relay network, we evaluated Cray Communications, Inc.'s FPX4802/DES Frame Relay Encryptor.

Other products that encrypt frame relay traffic include Cylink Corp.'s SecureFrame and Semaphore Communications Corp.'s NEU-ST.

We found that the device slowed transmission by more than 40% because it had to open and encrypt each packet, then reverse the process on the other end. Still, if you need high security for your applications, the overall benefit outweighs the delays.

Users looking to add encryption to their frame relay nets need to recognize the impact this will have on specific applications. The nice thing about the Cray unit is that users can be selective about which permanent virtual circuits (PVC) they actually encrypt, minimizing the overall performance impact on the network. However, we would also like to be able to apply the encryption by application, protocol, address and packet size.

The FPX4802/DES, about the size of a large dictionary, physically connects a router and a data service unit/channel service unit (DSU/CSU) interface. It features Motorola, Inc.'s 68030 processor on the encryptor board. Other models with additional processors are available. Users can also add a T-1 CSU that supports fractional T-1 connections, or a Multi-Rate DSU/CSU that supports V.32 dial backup. The units also come with 110- or 220-volt power supplies.

During setup, you specify which Data Link Connection Identifiers (DLCI) are to be encrypted. This way, some channels can remain clear while others are encrypted.

The unit supports packet sizes up to 2,000 bytes. When a packet is sent, the FPX4802/DES checks the DLCI bytes, and if it is going to a DLCI enabled for encryption, it encrypts the associated data. It then reassembles the packet without encrypting the DLCI bytes and sends it over the network. Incoming packets are also disassembled and decrypted. Front-panel LEDs blink when data is being encrypted and decrypted.

Cray's FPX4802/DES combines DES with RSA techniques. RSA takes two 100-digit prime numbers and multiplies them. The result is then used as the key for encrypting the data. Given the number of possible combinations, it is extremely difficult to break the code and decypher the data. Cray allows users to select an eight-character private encryption key. This key randomly generates a 56-bit public key using the RSA method, and the FPX4802/DES transmits the key to all authorized decryptors on the network.

Cray Communications offers standard and high-speed models of the FPX4802/DES that support full 64-bit Data Encryption Standard (DES), and there's a 40-bit key model that can be used internationally without a federal export license.

COMPARATIVE FRAME RELAY THROUGHPUT
(in bit/sec)

	64-byte packet	128-byte packet	512-byte packet	1,024-byte packet
Clear	7,394	9,683	12,555	13,202
Encrypted	3,850	4,959	6,230	6,511
Percent degradation	**52**	**51**	**50**	**49**

Because of the performance hit, you'll want to restrict encryption to the most important traffic and use the full bandwidth available for less sensitive traffic. By selecting a few DLCIs for encryption, the FPX4802/DES satisfies both needs.

The FPX4802/DES supports Simple Network Management Protocol, with a Management Information Base (MIB)

Scrambling frame relay

available from Cray Communications' bulletin board that includes capabilities for MIB-II authentication, and link-up and link-down traps. It also supports get and set commands, including GET, GET NEXT and SET.

We found that the FPX4802/DES slowed throughput to about 60% of non-encrypted network traffic on our 300K- and 1.5M-byte test files.

On these tests, packet sizes were set dynamically; we expect they were of small size. Using the IP utility under Windows 95, we transferred several files between remote systems across AT&T InterSpan Frame Relay Service. This utility uses NETBEUI protocols, and as a result, the traffic is a series of very small packets.

NetworkWorld Fusion
(http://www.nwfusion.com)

Go on-line to learn about competitors to the FPX4802/DES and about DES, the encryption specification used by the device. From the main menu, select NetRef then Buyer's Guides/Reviews.

The encryptor must open each packet to determine its destination and encrypt the data, if necessary. Thus, this is a worst case scenario.

Clear channel transfers ran faster than the 28.8K bit/sec channel limit of our hardware connection, meaning we were able to maintain better than 28.8K bit/sec constant throughput, regardless of file size or type of data. When we introduced the encryptors, throughput dropped by nearly 40% to just over 18K bit/sec.

Using the ping utility, we also sent 100 packets of various sizes across the frame relay link (see graphic, page 39). Again, the encryptor reduced the raw throughput of the line but with very little degradation as packet size increased. This implies that the overhead of encryption is tied more to the number of individual packets than to their size, which implies that the best use of this unit is on IP-based networks that send large files that use larger packets.

The installation process

We were able to generate all the above numbers fairly easily. According to Cray Communications, most units are installed by experienced personnel, but we were able to install and operate the units with little help from a Cray technician.

You can change DIP switch settings to disable SNMP and disable power-on self-test. Jumpers allow you to connect with older versions of Ethernet and change other communication settings.

You manage the FPX4802/DES setup routines through a VT-100/ANSI termi-

HOW WE DID IT

For our testing, we connected the FPX4802/DES to Bay Networks, Inc. Access Stack Node frame relay routers that support segmented fractional channels operating at 56K bit/sec through a DSU/CSU. The FPX4802/DES sits between the routers and the T-1 service.

We created a variety of 300K-byte files featuring several levels of compressed data. But as we determined that the type of file had little impact on the transmission, we created a 1.5M-byte file and sent that over the network. We also used a ping utility to send 100 packets of different block sizes across the network.

We ran initial tests without the FPX4802/DESs installed to determine baseline performance. We then installed the FPX4802/DES units and repeated the tests. We subtracted the times posted when the files were sent without the FPX4802/DESs installed from the times recorded with the FPX4802/DESs installed to quantify the loss of throughput introduced by the encryption routines.

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9362

Encryption methods

Several methods exist to secure data. One of the most basic is substitution, where specific letters and numbers replace the original characters in a message. For example, all characters "a" in the original message can be replaced by the character "t." This scheme can be broken fairly easily by analyzing the frequency of letter usage and word usage.

Transposition encryption provides a more secure approach. Under this scheme, some letters take the place of others. The most common transposition encryption is rot-13, where letters are rotated 13 positions down the alphabet and replaced.

In 1976, the National Standards Bureau defined its Data Encryption Standard (DES). This scheme combines transpose and substitution methods with a 56-bit key with eight error-correcting bits. The resulting 64-bit key creates 70 quadrillion potential combinations of bits, making DES very difficult to decipher without the key.

Other methods also exist. Public-key cryptosystems use two keys — one public and one private — to encrypt messages.

In practice, this scheme has not provided the computational efficiency of DES.

Another approach, RSA, starts with two 100-digit prime numbers and multiplies them to yield a key. The key is then used to encrypt and decrypt messages. RSA is one of the most highly secure and most commonly used encryption techniques.

—Jonathan Torta

nal connection on the back of the unit. You can configure the optional integrated DSU/CSU, set encryption keys, show the current key and schedule a key update.

When a key update is scheduled, the unit automatically notifies all FPX4802/DESs on the network and sends the new key. Keys should be changed regularly to ensure the integrity of the network.

The terminal also allows you to configure SNMP functions and set IP addresses. You can set the IP addresses for as many as 10 associated FPX4802/DESs that can communicate over the local-area or frame relay network. Each unit must be loaded with the same encryption/decryption key before they can communicate. The unit can automatically discover up to 16 FXP4802/DES IP addresses.

Terminal operations also provide status and statistics screens that show the number of transmitted frames and errors, as well as a utilities screen that lets users change the password, set the internal software clock and specify inactivity time-out periods.

You should realize that the encrypted transmission only extends from each FPX4802 unit — transmissions between the workstation and the local router are not encrypted. For this reason, you should also take time to physically secure the encryption equipment inside the computer room. Local wiring also needs to be checked.

Cray's manual offers exceptionally clear explanations of DES and SNMP concepts along with detailed operational instructions for the FPX4802/DES.

Companies that require a secure transmission will welcome the Cray products and not mind paying a performance price. Most companies, however, do not need the level of security promised by this product and will probably bypass this technology until they do. ■

The alliance is a cooperative of users, consultants, educators and integrators that applies its technical and business skills to analyze and compare strategic network products. A list of alliance partners can be found on page 33.

Torta is a test associate with TeleChoice, Inc. He can be reached via E-mail at jtorta @telechoice.com.

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Briefs

Ernst & Young LLP *has established a* **Center for Technology Enablement (CTE)** *that its consultants can tap for help in evaluating specialized or emerging technologies.*

The CTE will include Technology Laboratories in Dallas, Washington, D.C. and Los Angeles. Each lab is testing and evaluating new technologies such as Internet tools, wireless communications, client/server applications and management tools.

Ernst & Young: (212) 773-6109.

Software consulting firm **Strategic Focus** *has started a* **Software Evaluation Service** *that will aid customers in picking a client/server application development tool.*

In the Software Evaluation Service, the firm developed an order-entry application using eight different tools. In its reports, Strategic Focus tells clients how each tool fared in a variety of areas, including developer productivity.

Strategic Focus: (408) 942-1500.

TOOLS EVALUATED

These eight client/server application development tools have been evaluated under the Software Evaluation Service:

- Borland's Delphi
- Cognos' Axiant
- Dynasty Technologies' Dynasty 2.0
- Gupta Technologies' SQLwindows 5.0
- Microsoft's Visual Basic 4.0
- Oracle's Developer/2000
- ParcPlace Systems' Visual Works 2.0
- PowerSoft's PowerBuilder 4.0

Source Services Corp. *has published its* ***1996 Computer Salary Survey and Career Planning Guide.***

Survey findings are based on salaries for more than 95,000 positions nationwide and reveal that client/server application developers are in greatest demand.

For a free copy of the survey, call (800) 840-8090, Ext. 162.

A model for ongoing project cost-justification

By Jim Smith

CEOs are finding far too many network technology investments falling short of yielding promised bottom-line improvements and are knocking on your door for answers.

These problematic projects have innocent beginnings. With no shortage of good technology, executives pitch ideas for putting it to good use. You work with these managers on an initial cost-justification and get a sign-off from upper management on the promise that the investment will speed business processes, reduce overhead or provide some other benefit.

But without a clear mandate for continual cost-justification, the projects that look great on paper may not deliver real gains upon completion.

Four-step program

To avoid this problem, you can implement a four-step program to make sure projects deliver promised benefits.

First, get the chief executive officer to take more responsibility for forcing project sponsors to deliver what they promise. Too often the chief information officer or network manager is put in the position of holding other executives accountable for delivering expected benefits. This rarely works. To put it bluntly, you likely don't have the same clout as the CEO, especially if you're on the same or lower rung of the organization ladder as the executives you're dealing with.

It's up to the CEO to hold both parties — the CIO or network manager and the executive sponsor — responsible for tracking project benefits. Moreover, the progress being made toward achieving those benefits should be reported directly to the top on an ongoing basis.

Next, create a centralized review process to evaluate potential gains. Such a process is one way to provide a check and balance. A large utility company implemented this method within its 17 business units with great success.

Prior to reengineering the technology investment process, capital outlays were justified and budgeted at the departmental level. There was a calculation of the project's net present value (NPV) but no requirement for an auditor to certify that the NPV could be measured.

The benefits of continual cost-justification

- Accountability is spread among the CEO, network manager and a project's executive sponsor.
- Periodic reports measuring project results will aid in determining whether steps must be taken to control costs or adjust benefit expectations.
- You'll be better prepared to project bottom-line budget hits on an ongoing basis.
- Users will be required to demonstrate delivered benefits directly to the CEO.

Now executives have to acknowledge accountability for spending the money allocated or making sure the promised benefit sticks. An auditor from the accounting department also wades in to attest the benefits can be measured down the road.

Once you establish the check-and-balance process, systematically track results after the project is implemented. In theory, a given capital expenditure is projected to produce a net value over a period of years. In reality, the benefits of big projects with long lead times do not all show up at once and it often happens that no one tracks them in detail. As a result, the benefits used to originally justify the project's costs get lost in the shuffle, thereby making it difficult to ascertain if objectives were met and money was well spent.

One solution is to have the department head who requested the project file a monthly progress report showing how the endeavor is moving toward delivering expected benefits.

Project championship

Finally, act as a champion promoting shared responsibility for the success of projects. There needs to be a partnership in which the network department is responsible for delivering systems and project leaders are held accountable for putting them to good use. And the CEO needs to be at the helm, guiding both parties toward the end goal of making promised benefits a realty.

When the buck stops with the CEO, it doesn't go floating out the window.

Smith is general manager of NewTec Consulting, the management consulting and systems integration division of BEST in Seattle. E-mail him at jsmith@bestnet.com or call (206) 814-8104.

MANAGEMENT DATA ON-LINE

Network World peruses on-line services for interesting hints or tools that will make your job easier. Here are a few:

Standard information source

The American National Standards Institute and National Institute of Standards and Technology have made progress in developing the National Standards Systems Network (NSSN), which will eventually link the databases of many different standard bodies.

In fact, there are two NSSN Web sites you can visit, including the NSSN Test Bed Version 1.3a.

The NSSN Test Bed provides links to the home pages of various organizations involved in standards creation; a searchable collection of abstracts, catalogs and standards stored at the NSSN Test Bed site; and links to sites that have separate on-line collections of searchable standards. There is also a demonstration of what the eventual NSSN site will offer. Currently, the demo site lets you search a limited number of standards databases and gain access to Web sites maintained by other standards setting organizations.

Internet policy matter

Now that you've got your organization linked to the Internet, you've got to bring those 'Net newbies on staff up to speed on network etiquette — netiquette.

An on-line document titled "The Net: User Guidelines and Netiquette" can help. Found on Florida Atlantic University's Web site, the document is essentially a list of practical dos and don'ts for using the Internet. It includes hints to keep electronic mail messages short and focused on only one topic as well as a reminder to make resources available to others by keeping telnet sessions open only as long as they are needed.

Volunteer network

If you've got spare time and would like to help outfit your child's K-12 classrooms with networking technology, consider joining the Tech Corps. The nationwide nonprofit group's Web site details where chapters have been formed and how to join. Tech Corps members will work with school administrators, teachers and students on tasks such as installing, repairing or upgrading equipment, designing networks or building a Web site.

You can use Network World Fusion as your launching pad to the World-Wide Web sites mentioned here. Select careers and look for Management Data On-line for links to the sites.

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UNIX/NT Systems Engineer Strong background with large TCP/IP networks; UNIX/NT Administration (HP-UX, Solaris, AIX, SunOS, NT/AS); solid understanding of NFS, NIS, DNS, SMTP, SNA; Web Server and Internet connectivity experience is a plus.

Voice/Data Network Engineer Strong background in large voice/data networks; experience with Analog/Digital services, pbx, voice mail, video conferencing, traffic analyzers, telecommunication carriers and tariffs; ISDN; ATM; X.25; SNMP.

Internet Specialist Solid background in Internet connectivity; strong knowledge of Firewalls/Internet Security; experience with Web Server implementation/management, router configuration, Service Providers and POPs; UNIX, NT, TCP/IP, SMTP, DNS, FTP, NFS, ISDN, HTML.

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LAN Specialist Solid experience in large, multi-platform network environments; ECNE/CNE, NetWare 3.12/4.1, NT/AS, WIN95, TCP/IP, IPX, SNA, cc:Mail.

Technical Support Engineer Strong background in Desktop Support; excellent Communication/Interpersonal skills; previous hardware support experience; DOS, Windows, MS Office, and at least one e-mail product.

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Purdue University's Department of Computer Technology invites applications for tenure-track, assistant professor positions at various campuses beginning in August 1996. The department's mission focuses primarily on teaching and educational scholarship (not basic or applied research). Responsibilities include instructional development, educational scholarship, and service. Candidates for the position at its West Lafayette home campus should be able to teach local area network management, end user computing, programming, and personal computer databases. Candidates for a position at an outreach campus should be able to teach a large percentage of the A.S. degree curriculum including PC literacy, programming, operating systems, database concepts, and systems analysis and design fundamentals. An earned Masters Degree in a relevant field is required (the doctorate is not a requirement for employment, promotion, or tenure for these positions). All candidates must have atleast three years of full-time, relevant, industrial experience in information systems and business computing. Prior teaching experience is preferred. Applications will be accepted until the position is filled. Applicant interviewing is expected to begin in mid-March. Send a detailed resume, three letters of reference and academic transcripts to Professor Alka R. Harriger, Chair, Search and Screen Committee, Ad Code NW, Department of Computer Technology, Purdue University, 1421 Knoy Hall, Room 242, West Lafayette, IN 47907-1421. Questions should be directed to Professor Jeffrey L. Whitton, Department Head (voice: (317)494-4545; e-mail: jlwhitte@tech.purdue.edu). More information about Computer Technology at Purdue can be found at http://www.tech.purdue.edu/cpt/cpthome.html. Purdue University is an equal opportunity, affirmative action employer. Women and minorities are encouraged to apply.

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Enterprise Server Manager

Responsibilities include: proactive server management, disaster recovery planning and implementation, hardware/software optimization and server facilities planning. Must be capable of diagnosing problems related to network services, server operating systems and network communications. Technical skills include: strong understanding of server hardware and software technologies is required, including EISA, PCI, FDDI, SCSI, IDE, EIDE and RAID. Thorough understanding of Windows NT operating system, domain structure, security environment and account/group maintenance.

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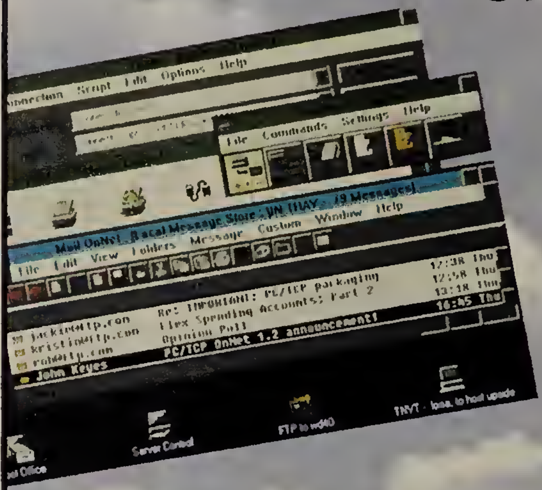

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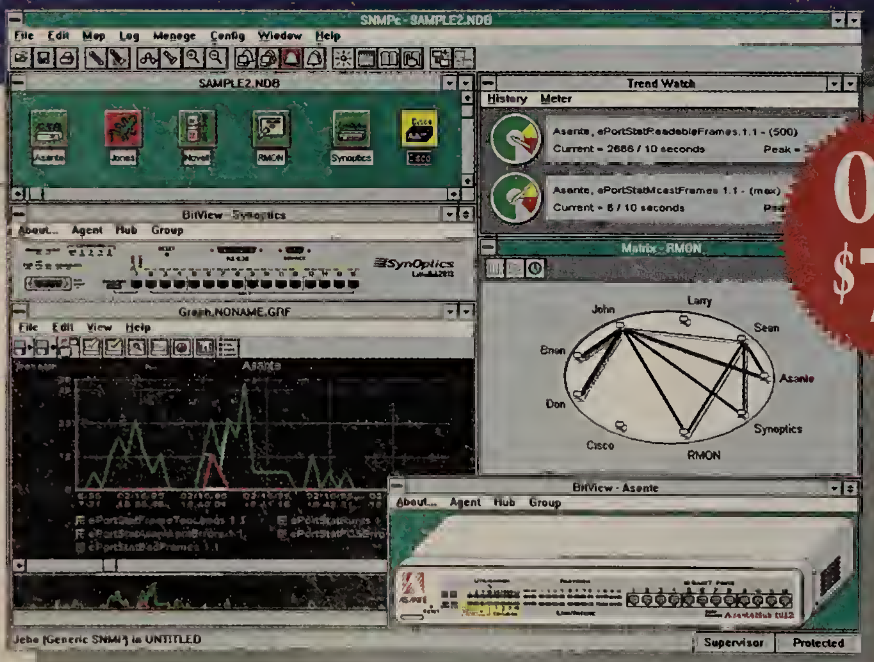

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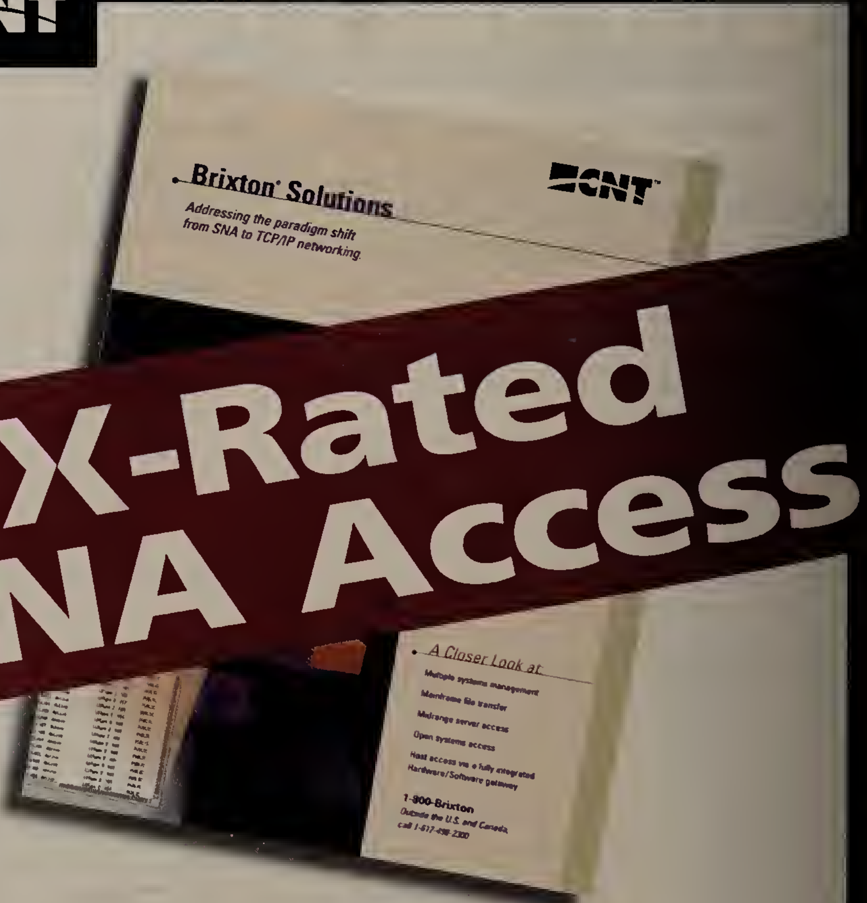

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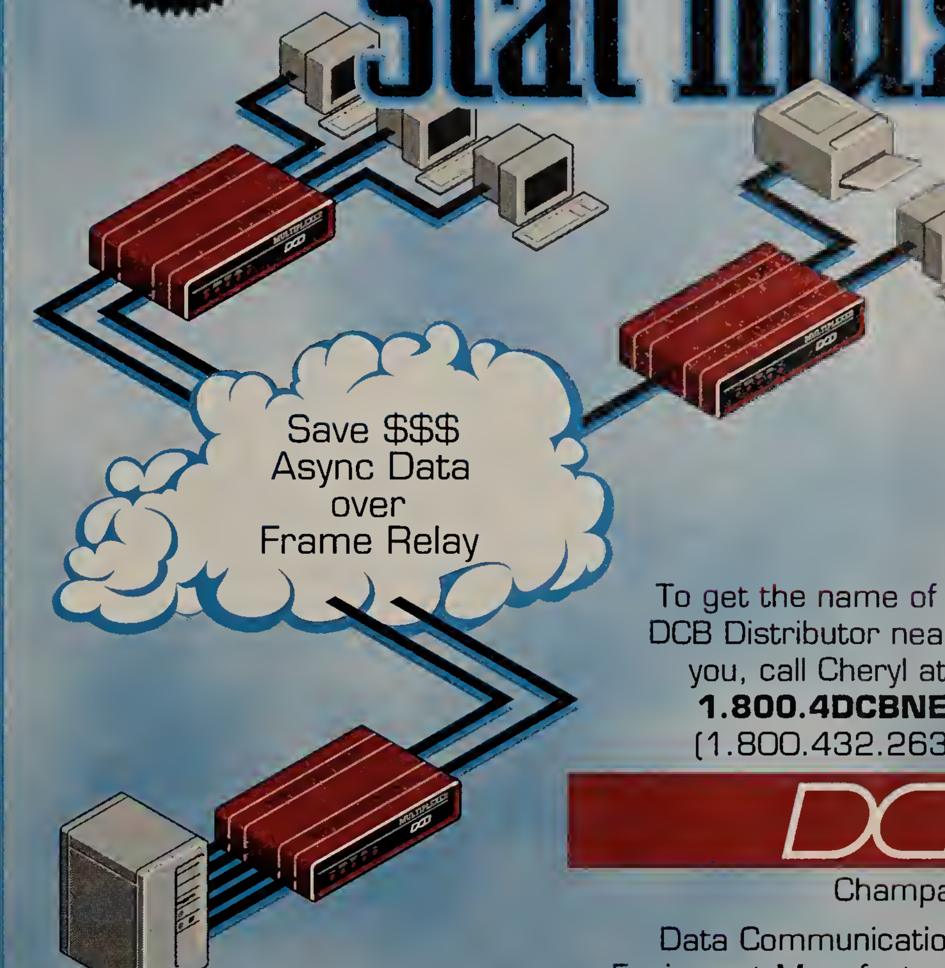

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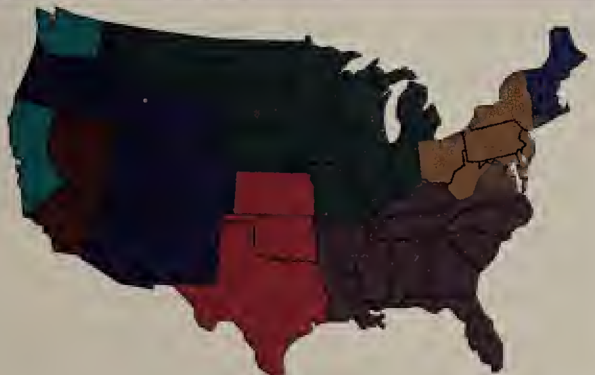

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IBM

Continued from page 1

boon to IBM's Lotus Notes customers.

And in further acknowledgement of and homage to Tivoli's expertise, IBM pegged Tivoli President Frank Moss to head IBM's systems management operations and will drop the SystemView brand name for client/server-specific offerings. SystemView products, however, will still be offered for mainframe-centric environments.

"The complexity of [distributed client/server and Internet] environments often exceeds the capability of traditional management tools," said John M. Thompson, senior vice president and software group executive at IBM. "Tivoli is the undisputed technical leader in distributed systems management."

Tivoli's strengths are in providing management tools, such as performance analysis, software distribution and workload monitoring, for Unix- and Windows-based systems from multiple vendors. Tivoli has allied with leading systems and software vendors to bring these products to market.

There is some fear among customers, though, that the IBM acquisition might make it harder to get the products they need because many of the vendors partnering with Tivoli are direct competitors of IBM (see story, this page).

While users pondered the product implications, IBM claimed it has little to reconcile with product overlap.

"Our focus has primarily been network management, while Tivoli's has been [managing] the applications that run above [the network]," Thompson said.

IBM may face a tougher challenge in melding the technical underpinnings of the two firms' offerings. Under the Karat project, for example, IBM has been working on adding its System Object Model (SOM) and Distributed SOM (DSOM) object-oriented technologies to SystemView for a couple of years.

It's not yet clear if there's space for SOM and DSOM in future SystemView/Tivoli offerings, said Leo Cole, IBM manager of strategy and global design for systems management. But there is synergy in SOM, DSOM and TME's compliance with the Common Object Request Broker Architecture standard, he said.

IBM believes it can iron out these wrinkles and other product integration issues in a matter of weeks, Thompson said.

> *Tivoli's strengths are in providing management tools, such as performance analysis, software distribution and workload monitoring, for Unix- and Windows-based systems.*

That relatively speedy turnaround may be due to a 2-year-old arrangement between the companies to share object technology.

While those issues are being hashed out, IBM also can leverage Tivoli's developments in application and 'Net management. Tivoli has developed an Application Management Specification (AMS) with which to instrument software to make it manageable (*NW*, May 1, 1995, page 20).

Several application vendors have licensed this spec. Also, Tivoli recently invested in start-up net.Genesis, a maker of Internet application development tools.

With this investment, Tivoli is expected to develop content and performance management tools for 'Net servers, browsers and applications. ■

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Microsoft

Continued from page 1

accessing such applications and sharing information between them.

However, there is some concern that Microsoft — a member of the coalition — could have an unfair advantage over competitors down the line as a result of its intimate involvement with the standard's creation.

"The good news is that Microsoft is doing something, so it raises visibility [for workflow], and Microsoft's stuff is incredibly simple," said one coalition member who asked for anonymity. "As ugly and bad as it may seem, it's probably a good thing for workflow."

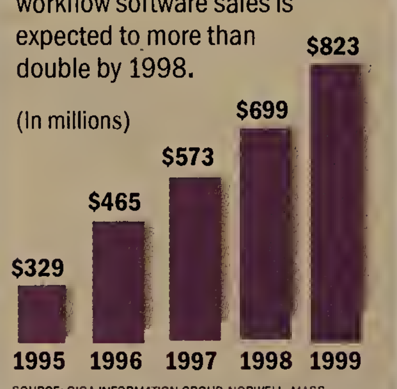
The coalition will align its Interface 4, an emerging specification that defines how workflow systems can communicate, with Microsoft's Messaging Application Programming Interface (MAPI) Workflow Framework. "There was a lot of overlap between Interface 4 and MAPI Workflow [Framework], so we agreed to combine our efforts," said Raul Medina Mora, vice chairman of the coalition's technical committee.

Members of the coalition, including a Microsoft representative, are expected to discuss the emerging workflow specification at GIGA Information Group's Business Process and Workflow '96 conference this week in Orlando.

The coalition will meet near Microsoft's Redmond, Wash., headquarters this spring to try to complete a specification by July, he said. Products supporting the specifications should emerge by early 1997.

Workflow on the rise

Revenue generated by worldwide workflow software sales is expected to more than double by 1998.



SOURCE: GIGA INFORMATION GROUP, NORWELL, MASS.

Prior to the convergence, Interface 4 included commands that were specific to certain types of messaging systems, said Steve Silverberg, a program manager for Microsoft's Business Systems Division. It also was the furthest behind schedule of the four specifications being devised by the consortium, he said.

Now the plan is to have Interface 4 define three or four basic commands for how workflow systems may be triggered and share information. But it will not include any messaging-specific commands.

As a result, users will be able to exploit the interface via E-mail systems, remote procedure calls and databases, Mora said.

On the MAPI

Microsoft's MAPI Workflow Framework is a set of message classes and properties that enable workflow applications to interact with MAPI messaging systems. Microsoft's initial motivation for creating the framework was to allow companies to add workflow capabilities to office applications that tie into its forthcoming Exchange Server.

To that end, Microsoft later this year will ship a set of OLE interfaces for using MAPI-based messaging systems to build or extend workflow applications, Silverberg said.

Most industry observers welcomed the integration of Microsoft's technology into the coalition's specification.

"I'm not threatened [by Microsoft's involvement]," said Rashid Khan, president of Ultimus, Ltd., a workflow software company in Raleigh, N.C. "MAPI Workflow provides some hooks, but it's not a workflow solution."

The fact that a standard is on the way is all that matters to Mike Balmuth, managing architect at DHL Systems, Inc., the technology arm of the courier company in Burlingame, Calif. "As far as Microsoft having an advantage, so what's new?" ■

Tivoli users leary, but hopeful

While IBM's acquisition of Tivoli Systems, Inc. has industry pundits waxing philosophical, it has some Tivoli customers worried.

Tivoli had a number of partnerships with IBM rivals — including Microsoft Corp., Sun Microsystems, Inc. and Hewlett-Packard Co. — and users fear those relationships may now disintegrate.

"It's going to put a substantial burden on Tivoli as well as Microsoft, Sun and HP to work together so that our needs get satisfied," said Dave Kessell, vice president of infrastructure projects at Charles Schwab & Company, Inc. in San Francisco.

Florida Power Corp.'s systems consultant Jim Rowland is also concerned, but hopeful, that IBM can improve some Tivoli shortcomings.

"I hope that this merger doesn't impede [Tivoli] development," Rowland said. "Tivoli has been pretty quick to respond to user requests for product enhancements and bug fixes. I do hope that maybe IBM can bring some additional strength to [Tivoli's] customer support area."

Hospital service provider Medaphis Corp. recently bought $3.5 million worth of Tivoli products for managing a nationwide information processing network. The company was worried when word of the deal first leaked, but has been reassured by IBM plans to retain Tivoli's Frank Moss as systems management chief, pump cash into the Tivoli product line and maintain its heterogeneity.

—Jim Duffy and Michael Cooney

Back to Reality

Vendors praying for quick ATM conversion are waiting for the wrong miracle

I was hobnobbing in the ComNet '96 trade show pressroom last Tuesday morning when suddenly I heard music. Heavenly music.

Across the hall were 10 gospel singers, stirring religious fervor as they belted out "We shall overcome!" over and over again. The loud choir was a blatant gimmick aimed to lure the Fourth Estate away from trading important gossip and into StrataCom, Inc.'s press conference. (It worked. And here I am writing about the stunt. Amazing.)

David J. Buerger

StrataCom's executives revealed their religious mission – to overcome the heathen naysayers of networking products based on Asynchronous Transfer Mode.

Actually, I doubt this was the company's real intention. But StrataCom's choice of hymn and message was an inadvertent public admission that the ATM market is uncomfortably soft.

StrataCom was not the only ATM vendor at ComNet on the defensive. General DataComm, Inc. (GDC), which for the past three years has trumpeted ATM at trade shows, was strangely quiet about the technology. GDC is a leading seller of ATM switches, especially to carriers. Nevertheless, it chose instead to pitch new remote access products.

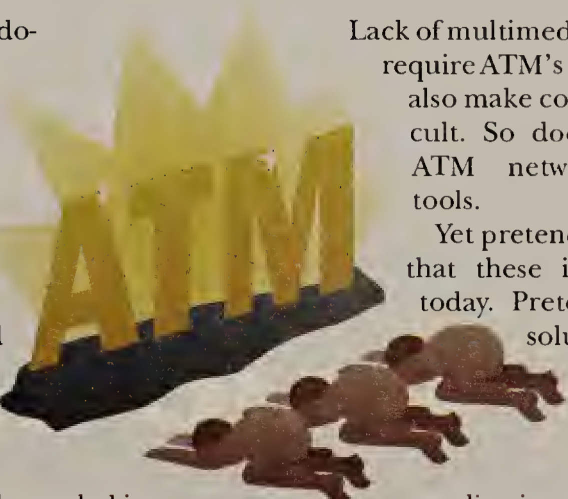
"ATM did not materialize as fast as we thought," admitted a GDC employee. "End users have been very cautious, especially in the U.S. They are finding it hard to cost-justify buying advanced technology now."

Newbridge Networks, Inc. – another major ATM supplier – has run into the same wall of resistance from workgroup switch buyers. Observers say that sales of Newbridge's Vivid products are lagging the company's expectations.

These vendors, along with dozens of other players hawking ATM gear, have placed big bets on cell switching. It's the first time in my memory that so many vendors have simultaneously offered products based on a next-generation technology. Their motivation is obvious. Vendors want to diversify from commodity networking products and sell stuff with fatter margins.

Unfortunately for them, the ATM religion is not selling well. International Data Corp., for instance, predicts sales of only 200,000 LAN-based switch ports during 1996. I bet the only vendor really making money in this arena is Fore Systems, Inc. Fore OEMs its products to many vendors, including Northern Telecom, Inc., Sprint Corp., Cabletron Systems, Inc., Optical Data Systems and Madge Networks, Ltd.

Telecommunications carriers are much more willing to buy ATM switches. Right now, they're doing it to boost backbone capacity because the market for ATM services is in its infancy. It represents a paltry revenue source.



The worldwide ATM, SMDS and frame relay services market last year was $1.8 billion. But ATM's slice was just 4%; frame relay reeled in 92%, according to Rosemary Cochran, a principal at Vertical Systems Group. By way of contrast, leased lines pulled in $6 billion.

IBM hopes to boost ATM desktop sales by cutting prices. At ComNet, the company announced a switch and 25M bit/sec adapter package for $495 per user. This is a terrific value for users, but I doubt that price alone will turn the tide.

Other roadblocks

There are other reasons why ATM sales are behind everyone's expectations. For one thing, the trade press has overhyped ATM since 1991. Shame on us. And shame on readers for believing everything printed in those "other" networking publications.

In addition, the technical standards process has started to bog down under the weight of 834 ATM Forum members, whose lobbying sometimes turns political. The forum needs to finish at least eight key specifications during the next year.

Lack of multimedia applications that require ATM's transport capability also make cost-justification difficult. So does the absence of ATM network management tools.

Yet pretend, by some miracle, that these issues were solved today. Pretend that all ATM solutions cost the same as any Ethernet product. Pretend further that killer multimedia applications (whatever they were) cried for ATM's help. Even this scenario would not guarantee a quick ATM sales lift.

Why? Religious conviction is based more on feelings than logic. And most people do not change religions overnight. The prevailing religion in networking is packet and frame switching. Gradually, people will convert to ATM. And by the time ATM achieves the same measure of worship now enjoyed by packet and frame switching, trade publications will be hyping the next generation of networking technology.

Vendors should stop praying for a sudden, mass conversion to pure ATM. Their recent effort to integrate ATM into existing products is a better strategy. This course will put revenue in their pockets now and make switching to ATM less of a religious issue.

Buerger is an Atlanta-based writer and industry consultant. He can be reached at dbuerger@pipeline.com.

CyberSpeak

Voices from the reader network

Does Apple have a future in your network?

"The [AppleTalk] networking technology? No. We are slowly phasing Apples out and going over toward the Windows environment. It has been a continual process for the last three to five years. At this point, the vast majority of applications are available in the Windows environment and not in the Apple environment."
John Dubiel, manager of planning, Boston Edison, Boston

"We are about half Mac and half PC right now, but the Macintosh environment is diminishing. We will have Macintosh phased out in the next three years as a matter of policy. We've been hitting our heads against the wall trying to integrate Macs and PCs into the same environment. The software vendors just haven't provided the products for us."
Roy Hegge, senior network engineer, ADC Telecommunications, Inc., Minnetonka, Minn.

"I don't see it going away. There are people on our network who use AppleTalk. People who use it love it, and people who do graphics love it. It's definitely still viable."
Kevin Hart, systems administrator, Electronic Book Technologies, Providence, R.I.

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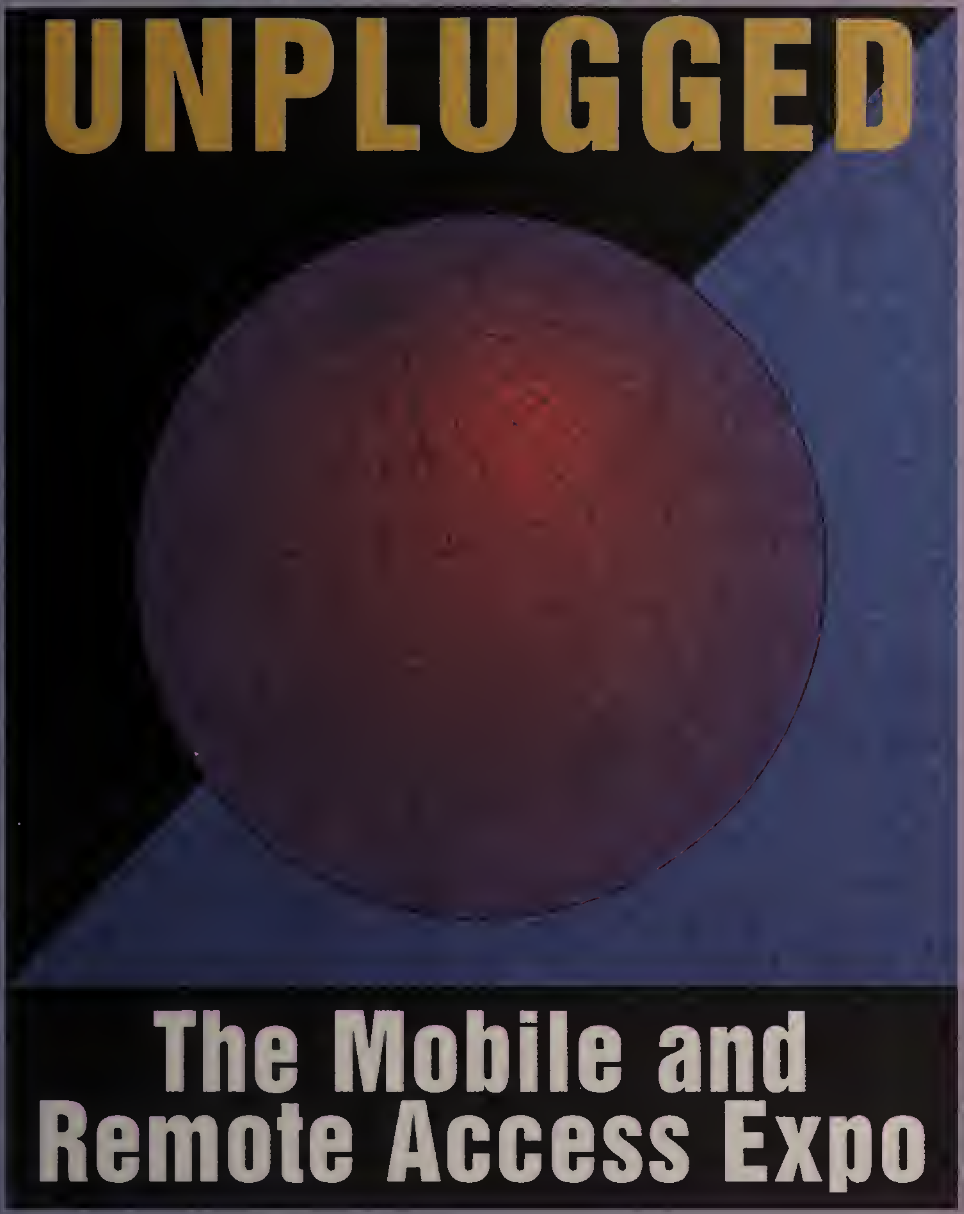

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